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USSR REPORT

Economic Affairs

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/Article by L. Rozenova, chief of a department of the USSR State Committee on Prices, Moscow: "Price of New Equipment"/

/Text/ The policy of intensification of public production envisages an extensive application of the achievements of science and technology and of advanced experience. The November (1982) and June (1983) Plenums of the CPSU Central Committee envisaged additional measures to accelerate scientific and technical progress. It was noted that during a historically short period our country reached the advanced lines of progress and became a strong industrial power having a powerful scientific and technical potential at its disposal. The further development of the economy requires the linking of the advantages of the socialist system with the achievements of the scientific and technical revolution.

For the purpose of solving this problem, the CPSU Central Committee and the USSR Council of Ministers adopted the decision "On Measures for the Acceleration of Scientific and Technical Progress in the National Economy." It envisages ensuring in the next few years the output of machinery, equipment, instruments, materials and other products meeting in their technical and economic indicators the highest world level, as well as the introduction of advanced technologies and methods of production organization. On this basis labor productivity should be increased significantly in all national economic sectors.

The acceleration of the rates of scientific and technical progress is an overall problem. Therefore, the decree envisages ways of improving the planning of the introduction of new equipment, controlling the technical level of produced articles, strengthening the standardization and improving the certification of products and increasing material interest in the mastering of new equipment. Among the measures contributing to an increase in the output of machinery, equipment and instruments of a high technical level and quality and to a prompt removal of obsolete products from production an important place belongs to prices.

How do matters stand with the formation of prices of new equipment? A number of fundamental decisions aimed at improving the practice and methodology of price setting have been adopted recently. The USSR State Committee on Prices

approved the "Method of Determining Wholesale Prices and Standards of Net Output for New Machinery, Equipment and Instruments for Production and Technical Purposes." More favorable economic conditions have been created for enterprises mastering new equipment. For example, wholesale prices of newly mastered machinery and equipment fully refund economically substantiated (standard) expenditures to the manufacturer and as early as the first year of their series production ensure a high profitability, which cannot be lower than the planned profitability for a given enterprise or the replaced equipment.

The established incentive increments in wholesale prices play an important role in stimulating the mastering of highly efficient equipment. In accordance with the indicated decree of the CPSU Central Committee and the USSR Council of Ministers the role of such increments, whose amount can constitute up to 30 percent of the wholesale prices depending on the efficiency of new equipment, has been strengthened. It is determined through a comparison of the expenditures on the development of machinery, equipment and instruments and the results of their application.

For the purpose of stimulating a reduction in production expenditures, it has been established that, when raw materials and supplies are replaced with cheaper ones and the quality of products is retained, their wholesale prices are not changed. When new equipment with a lowered material and labor intensiveness is mastered, wholesale prices remain at the level of prices of the replaced machinery and equipment, that is, the entire additional profit formed as a result of the reduction in production costs remains at manufacturing enterprises. For products in the superior quality category up to 50 percent of the saving is taken into account in the incentive increment.

For example, a technique of restoring worn out cold rolls, which in their quality are not inferior to new ones, has been introduced at the Uralmash Production Association. The mastered technique makes it possible to attain a significant saving of roll forgings, as well as of labor expenditures. For the purpose of stimulation wholesale prices of restored rolls have been set at the level of wholesale prices of new ones, which has provided the association with an increased profit in the production of restored units.

The Ministry of Instrument Making, Automation Equipment and Control Systems together with customers has carried out a set of operations concerning the replacement of natural "big-carat" diamond raw materials with "small-carat" ones in the manufacture of dies intended for the production of brass-plated steel wire. According to the calculation of the USSR Ministry of Finance, in 1983 the actual saving of natural diamonds amounted to about 10,000 carats. An incentive increment at the rate of 70 percent of the economic effect (15 percent of the wholesale prices) in the wholesale prices of the indicated dies was set.

As already noted, the existing procedure of setting prices and increments fully ensures the interest of enterprises in saving all types of resources during the production of new equipment. However, as the practice of price formation shows, machine building ministries and the scientific research institutes, design offices and enterprises subordinate to them do not pay much

attention to planning new products, whose economic effect is connected with a reduction in their material intensiveness. Of the total number of wholesale prices with incentive increments for new machinery, equipment and instruments the share of increments for a reduction in material intensivess comprised only 5 percent.

There are still cases of development of new equipment with metal intensiveness exceeding indicators of the best foreign and domestic models. Materials submitted by ministries for the substantiation of prices, as well as expert examinations of individual products by the USSR State Committee on Prices, attest to this.

For example, the USSR State Committee on Prices made an expert examination of the wholesale price of the MMS-90-30A wet-self grinding mill (with welded-forged-cast pins) produced by the Syzran Turbine Building Plant. Its results have shown that in its specific material and power intensiveness the mill is much inferior to foreign models and basic domestic equipment and the cost of its manufacture greatly exceeds the economically substantiated price level, which points to its inefficient production. With due regard for the conclusions of the expert examination it was suggested that the manufacturer examine the problem of the economic advisability of the further output of this product.

The possibilities of saving resources during the production of new equipment are connected both with an improvement in the design of machines and mechanisms and in their manufacturing technique and with the use of advanced materials. Modern atomic, chemical, motor-vehicle and agricultural machine building, electrical and radio engineering and instrument making cannot be based on the old quality, for example, of metal. Especially big demands are placed on the output of the chemical industry, in particular plastic production. Therefore, problems of improving the setting of prices and increments for new types of materials and of increasing their stimulating role fully pertain to the chemical industry, ferrous and nonferrous metallurgy and other sectors. The establishment of wholesale prices of materials with due regard for the final effect of their application in machinery and equipment is a major task.

For the purpose of stimulating the expansion of the sphere of application of advanced, new materials, their wholesale prices are revised as production expenditures are lowered. For example, since 1982 wholesale prices of plastics have been reduced by an average of 11 percent and of articles from them for motor vehicles, tractors and agricultural machines, by 20.5 percent. This expands the economic limits of utilization of plastics instead of ferrous and nonferrous metals. In the course of the revision of wholesale prices the correlations for the output of nonferrous metallurgy have been improved in the direction of stimulation of the output of the most efficient low-alloy steel, small-diameter graded rolled stock and sheet. As of 1982 a lower level of prices of rolled sheet stock has been established, which contributes to the application of a more advanced and efficient technique--welding and stamping instead of cutting--in machine building and metalworking. The replacement of graded rolled stock with sheet stock makes it possible to save up to 30 percent of the metal.

The manufacture of parts by the methods of powder metallurgy is the most important direction in the saving of resources in machine building. Whereas in traditional production on the basis of cutting the coefficient of utilization is from 0.3 to 0.7, in the manufacture of the same parts from powder, 0.85 to 0.95.

For the purpose of stimulating the use of powders, wholesale prices of iron powder of the PZh2 brand have been lowered by an average of 30 percent as of last year and of iron powders of PZhZ-PZh6 brands, as of this year.

The wholesale prices of powders currently in effect are differentiated with due regard for their technical and economic characteristics and quality. At the same time, technical documents, which would regulate the area of application of the indicated powders, are not available. This leads to the fact that high-quality expensive powders are used for the manufacture of simple articles in the first and second groups of complexity and of articles, on the mechanical properties of which high demands are not placed.

Essentially, the use of powders is determined not by the technical and economic advisability, but by their actual availability for manufacturers with due regard for deliveries carried out by supply organs. The utilization of high-quality materials not according to purpose lowers the efficiency of their application. In this connection the State Committee for Standards with due regard for the interested ministries and departments must develop standard-technical documents regulating efficient areas of application of appropriate powders.

The development of new equipment should be directed toward ensuring a reduction in the costs of products, in the production of which new machines and mechanisms are used. This means that new equipment should ensure the saving of resources during its operation, including raw materials, fuel and live labor. For example, last year the enterprises of the Ministry of the Electrical Equipment Industry mastered a new ion chamber vacuum installation for the application of hardening coatings to tools. Along with a higher productivity (as compared with the previously mastered Bulat-ZT) this unit ensures a smaller specific consumption of electric power. With due regard for its high efficiency an incentive increment--15,000 rubles--in its wholesale price of 50,000 rubles has been approved. Increasing the service life of machine building products is one of the ways of saving resources. When advanced techniques (laser treatment, spraying and so forth) are used and the length of operation of new articles is increased, incentive increments in their wholesale prices are also established. For example, the tool plants of the Ministry of Instrument Making, Automation Equipment and Control Systems mastered the production of tools with wear resistant coatings increasing their service life twofold and more. Incentive increments at the rate of 30 percent in the wholesale prices of such tools (screw taps, countersinks, drills, hob cutters, cutting tools and gear shaping cutter heads) have been established.

A total of 1,800 incentive increments in wholesale prices of new machinery, equipment and instruments were approved during the first 6 months of last year. As practice shows, the use of increments is an effective measure of stimulating highly efficient, new products, because up to 70 percent of the amount of increments is allocated for the economic incentive funds of developers of new equipment.

The system of additional payments (price reductions) for a change in the qualitative characteristics of articles has also become widespread in lists of wholesale prices of machine building products. During the manufacture of transformers more efficient in operation as a result of a smaller consumption of electric power provision has been made for a payment in addition to the wholesale price in the amount of 500 rubles per kilowatt of reduction of idling losses as compared with basic ones recorded in standard-technical documents. Conversely, a price reduction in the same amount per kilowatt of excess of idling losses and overconsumption of electric power was set.

Additional payments for an increase and price reductions for a decrease in bearing accuracy, as well as for a change in other qualitative indicators, have been established. For example, an additional payment at the rate of 3 percent of the wholesale prices per 10 percent of the increase in the service life has been established. When bearings with a lower noisiness are manufactured, additional payments at the rate of 20 to 70 percent are also envisaged.

A scale of additional payments for a change in the dynamic parameters of thyristors (critical speed of buildup of direct voltage and current and the turn-off time) has been developed. For changing the turn-off time from 70 microseconds envisaged under existing technical conditions to 30 microseconds the wholesale price increment was established at the rate of 8 percent.

The sphere of application of increments for an improvement in the quality of articles must be expanded and applied in machine building sectors, where they are not yet introduced sufficiently. When increments are established, the problem of measuring technical and economic indicators and reflecting them in existing and long-term standards, which determine the direction of development of technical progress, arises. Unfortunately, standard technical documents for many types of equipment do not contain long-term requirements for an increase in the qualitative indicators of products. This hampers the evaluation of their technical level and stimulation by means of prices of long-term requirements of the national economy for the appropriate equipment.

Economic measures for the stimulation, mastering and increase in the output of new equipment can give a positive effect with the appropriate design and technological reserve for the development of new products and their manufacturing technique. There are cases when enterprises, having removed obsolete products from production, do not replace them with more advanced ones owing to the lack of developments by appropriate scientific research institutes and design offices.

The output of new equipment in a limited quantity, much smaller than of previously mastered machines removed from production, is the most widespread. Both during the planning and placement of new equipment in production problems of ensuring the manufacture and deliveries of accessories and materials for it are not solved in an overall manner. These articles and materials are produced in an insufficient quantity, according to the so-called alternate technique, which hampers an increase in the output of new machinery and equipment and in the efficiency of their utilization.

Along with the stimulation of new equipment economic sanctions against obsolete output should be intensified. It is necessary to improve the establishment of wholesale price reductions, whose amount, in accordance with the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures To Accelerate Scientific and Technical Progress in the National Economy," should be increased to 30 percent of the price. The procedure of establishment of price reductions that was in effect did not significantly affect the renovation of products and the removal of obsolete equipment from production in connection with the lack of objectivity of sectorial certification and the negligible share of products in the second quality category.

The practice of establishment by the USSR State Committee on Prices in 1982-1984 of price reductions for products subject to removal from production according to the plan for the economic and social development of the USSR has shown their effectiveness. As of last year this procedure has also been applied to articles, which are included in the plans of ministries and departments as subject to removal from production. In accordance with the new procedure wholesale price reductions have been established in the amount of profit adopted during the approval of a wholesale price of this output, but no less than 10 and no more than 30 percent of the wholesale price.

At the same time, it should be noted that in a number of cases ministries formally approach the preparation of sectorial plans and the reflection in them of products subject to removal from production and include in these plans articles, which, in fact, are no longer manufactured. For example, the sectorial plan of the Ministry of Instrument Making, Automation Equipment and Control Systems for last year envisaged (in addition to the state plan for the economic and social development of the USSR) 205 articles for removal from production, including 25 general-purpose machine tools no longer manufactured, whose prices were abolished in 1982. For example, the ZP756L face grinding semiautomatic device subject, in accordance with the plan, to removal from production during the fourth quarter of last year has not been manufactured since 1981 and has not been included in the price list put into effect in 1982.

For the remaining obsolete output not certified in the superior or first-quality category price reductions at the rate of 30 percent of the wholesale price are entered in the budget by associations and manufacturing enterprises without additional directives on the part of the body that has approved the price of this output. Such output is sold by consumers at wholesale prices without reductions. The amount of price reductions is not taken into consideration in the plan and the evaluation of plan fulfillment is made with due regard for them. Thus, the mechanism of incentive increments and price reductions envisages their close dependence on the technical level, quality and efficiency of output.

Despite the stimulation of the output of new machinery and equipment machine building ministries do not sufficiently master advanced equipment and technology. Waste-free technology is introduced slowly. In practice, waste in machine building is not reduced, comprising about 30 percent. Secondary raw materials are not utilized satisfactorily and traditional methods of production of parts on the basis of cutting remain the most widespread. The Ministry of Instrument Making, Automation Equipment and Control Systems slowly masters equipment for the manufacture of articles from powders and automated complexes equipped with industrial robots.

In our opinion, it is necessary to increase the responsibility of consumers for the use of new equipment, acceleration of the mastering of production capacities and increase in their shift coefficient. A real increase in the efficiency of new equipment in the national economy is hampered by the availability of above-standard stocks of uninstalled, as well as installed, equipment, but not put into operation.

The problem of an efficient utilization of productive capital also remains urgent in sectors operating under the conditions of the economic experiment. Essentially, in these sectors there is no significant improvement in the utilization of capital and there are big above-standard commodity stocks not credited by the bank. In this connection it would be advisable to introduce economic sanctions for a mismanaged use of equipment.

Here of interest is the experience of the GDR, where planning organs have established shift standards for the operation of equipment at specific enterprises and combines. If equipment operates less than the standard one, economic sanctions at an annual rate of up to 6 percent of the value of underutilized capital are envisaged.

In our opinion, it is advisable to introduce sanctions for above-standard stocks of materials and equipment not installed on schedule, as well as production capacities not mastered on schedule. At the same time, the additional payment for capital should not be taken into consideration in the profit distribution plan, but, in fact, be effected from the profit left at the disposal of an enterprise.

Along with the development of new equipment and increase in the responsibility for its introduction into operation maintaining the existing pool of equipment in national economic sectors in an efficient state is of great importance. As is well known, the problem of fully meeting the need for spare parts has not yet been solved. In this connection the collection and restoration of worn out parts are the most important tasks.

Unfortunately, at present many parts of machinery and equipment are turned into metal scrap and are not utilized in the national economy. The restoration and reuse of tires, bearings and the most important parts of motor vehicles, tractors, agricultural machines and some others are now organized. The existing statutes on an increase in the interest of enterprises, organizations and kolkhozes in the collection of worn out parts encompass a limited list of products and do not fully meet the set task of widely drawing secondary resources into the economic turnover. In our opinion, control over the use of secondary material resources and development of capacities for their processing and restoration on the part of the USSR State Committee for Material and Technical Supply, the USSR State Planning Committee and appropriate ministries should be intensified.

In the last 10 years expenditures on major repairs of machinery and equipment in industry have doubled not only through an increase in the volume of work, but also in the value of spare parts. Owing to their insufficient output by machine building enterprises, the production of some parts is organized at repair shops, where expenditures are twice as high as at specialized enterprises and the quality of manufactured spare parts is lower.

At present an increase in the output of spare parts, as well as the restoration of worn out parts and units, is an urgent task. When accomplishing it, it is advisable not only to restore, but also to increase, their wear resistance. The existing procedure of setting prices of restored units and parts stimulates an improvement in their quality and durability.

Wholesale prices for the restoration of individual worn out parts are determined on the basis of economically substantiated expenditures connected with the performance of work. At the same time, the maximum permissible level of wholesale prices is determined so that these prices do not exceed 0.9 /percent/ of the wholesale prices of the same new parts. This requirement also applies to the formation of prices for restoration, after which the wear resistance (service life) of a part is not lower than of the same new part. If restoration is made by advanced methods (plasma spraying, laser hardening and polymer and other coatings), as a result of which the wear resistance (service life) of a part is increased as compared with new parts, wholesale prices can be equal to or higher than the wholesale prices of the same new parts with due regard for an increase in their wear resistance.

With regard to the production of new spare parts, for the purpose of stimulating their output, wholesale prices take into consideration profitability increased one and a half- to two-fold as compared with the appropriate equipment. At present wholesale prices put into effect in 1982 ensure a profitable production of spare parts.

At the same time, as machinery and equipment are removed from production (when they are replaced with new ones) in connection with a reduction in the series nature of the output of parts and units expenditures increase, which lowers the interest of enterprises in their manufacture. Therefore, the conditions of the economic experiment, for the purpose of stimulating the output of spare parts for machine building products removed from production, stipulate that their wholesale prices can be revised during the five-year plan with due regard for the increase in the expenditures on their manufacture.

This article touches upon problems connected with the stimulation of the production of new equipment and intensification of the role of prices in the saving of all types of resources. At the October (1984) Plenum of the CPSU Central Committee Comrade K. U. Chernenko stressed that "... it is important to persistently continue in all sectors the line of intensification of the policy of economy and improvement in management and the economic mechanism." Therefore, the further improvement in work on the formation of prices of new equipment contributing to an increase in the efficiency of public production becomes especially urgent.

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RESOURCE UTILIZATION AND SUPPLY

ORGANIZATION, FUNCTION OF USSR SUPPLY SYSTEM DESCRIBED

Moscow EKONOMICHESKAYA GAZETA in Russian No 13, Mar 85 pp 11-14

[Material for Topic 4 "Organization of Material and Technical Supply and Strict Observance of Contract Discipline" in the worker education course "The Economic Mechanism: The Economic Experiment in Industry": "The Organization of Supply and Delivery Discipline"]

[Text] The efficiency of social production depends to no small degree on the organization of the supply of materials and equipment, which is a planned process of the distribution and the organization of distribution of the means of production.

The most important task of material and technical supply is to furnish the economy raw materials, supplies, spare parts, and equipment without interruption, to perfect the pattern of consumption of resources by solving important problems of the national economy, to build up the right physical stocks and to maneuver them astutely, and to improve the relations among sectors and economic entities.

The various aspects of improving the supply of materials and equipment occupy an important place in the large-scale economic experiment being conducted to broaden the independence and enhance the responsibility of enterprises for the results of their activity. That is why there is now a search for new forms and methods of planning the supply of materials and equipment and for organizing the prompt delivery of resources.

First, a properly adjusted mechanism for furnishing materials and equipment to enterprises and associations is a most important condition for the effectiveness of economic levers and incentives.

Second, the economic experiment is helping to organize smooth operation and promotes the prompt delivery of articles to consumers in accordance with contracts. In our multisector economy strict observance of delivery discipline has tremendous importance. Any deficiency in delivery under contract can cause serious disruptions in the operation of entire sectors and can disrupt the entire pace of production. That is why it is especially important to require prompt and complete performance of contractual obligations concerning

product deliveries. Improvement of all aspects of the economic mechanism to solve this problem is one of the central problems of the experiment.

Planning Supply

Plans for the supply of materials and equipment are an integral part of state plans for economic and social development. They include physical balances and plans for distribution of physical resources among USSR ministries and departments and union republics.

The physical balances are a system of indicators reflecting the quantitative relationship between resources to be built up by sources of origin and their distribution by types of use. Their principal function is to ensure balanced growth of the country's economy on the basis of comprehensive linkage of planning targets with the available materials and equipment, effective ways of achieving high final results for the national economy while optimally combining the sectoral and regional development, and guaranteeing intersector and intrasector proportions. The advances of scientific-technical progress, the performance characteristics of products, their interchangeability, comprehensive utilization of resources and their recovery for reuse are taken into account when the physical balances are being shaped and worked out.

As a rule the physical balances and distribution plans are compiled by USSR Gosplan and USSR Gossnab for a consolidated nomenclature. Delivery plans are worked out by authorities for the supply of materials and equipment so as to take into account the detailed need for products which production associations (enterprises) report to the regional components for the supply of materials and equipment, to ministries, departments and soyuzglavenabsbyty [USSR main administrations for supply and sales of particular products].

In recent years a number of steps have been taken to raise the level of planning so as to improve the linkage of physical resources to the requirement for them at every level of the economy, to make optimum use of raw materials, supplies, fuel and energy, and to strengthen delivery discipline. Work collectives are being given an enhanced role in the management of production, in prompt performance of contractual obligations concerning product deliveries by enterprises, and in the thrifty and optimum consumption of physical resources.

In order to improve work on the internal consistency of plans and creation of conditions for work collectives so that they participate more widely in working out the assortment of products to be produced, the regulation on the economic experiment called for the draft of the 5-year plan to be compiled by production associations (enterprises) in accordance with reference figures, physical resource limits and economic norms communicated to them by superior authorities as well as on the basis of direct long-term business relations and orders of organizations of USSR Gossnab and the USSR Ministry of Trade for product deliveries.

On this basis, before beginning to draft the 5-year and annual plans ministries are required to define the product nomenclature and adopt it subject to clearance with USSR Gosplan and USSR Gossnab; production associations

(enterprises) then use it to state the volume of production in physical terms, the limits and the stocks of materials and equipment in annual plans.

To meet the case of production associations (enterprises) building a one-of-a-kind product with a lengthy production cycle, USSR Gosplan, jointly with ministries, is to furnish in the draft of the 5-year plan a specific list of equipment stating its specific types cross-referenced with customers and facilities where it is to be installed.

Satisfaction of this requirement affords enterprises manufacturing one-of-a-kind equipment an opportunity to agree with customers in advance on the technical requirements of the product to be manufactured, to ready its jigs, tools and fixtures and to prepare production in good time, to reach agreement with components for the supply of materials and equipment and with suppliers on the product list, dates and special details for delivery of the necessary materials and equipment.

The deadlines for drafting and breaking down annual plans for the production and distribution of output are changed for those participating in the economic experiment. Provision has been made for plans and allocations of physical and technical resources to be broken down to production associations (enterprises) by dates so that USSR Gossnab no longer has to issue advance schedule-orders for the products and is able to issue job orders (assignment plans) for their delivery no later than 2 months before the year being planned begins.

When the plan for 1985 was being drafted, in April 1984 participants in the experiment received the reference figures and norms for the principal indicators and also allocations for materials and equipment on the basis of which ministries, jointly with production associations (enterprises), worked out detailed production plans in good time. Components of USSR Gossnab issued enterprises job orders (assignment plans) in good time for delivery of products, which made it possible for them to improve the preparation of production and to work out contractual relations promptly and more soundly.

In order to ensure consistency between the value and physical indicators in annual plans of production associations (enterprises) the principle has been laid down that the volume of production in value terms and other value indicators are to be determined in these plans on the basis of the targets of the state plan for the production of the most important products in physical terms and the contracts concluded for product deliveries.

Optimum Utilization of Resources

One of the important problems that has been exerting a noticeable influence on the consistency of production plans with their physical and technical backing is improvement of the effort at economical and optimum utilization of physical resources, fuel and energy.

The decisions of the 26th party congress stated: "The economy regime is to be tightened in production, in the service sector and in administration. Measures are to be drafted and carried out to eliminate losses in industry,

construction, transportation, agriculture and other sectors." The task was set of strengthening the orientation of economic development toward a faster growth of the results of production by comparison with material costs and to achieve a reduction of the energy- and materials-intensiveness of production everywhere.

Optimum and economical utilization of physical resources is one of the principal factors influencing production efficiency. The further development of science and technology, of industry, of transportation and communications, and of agriculture and ensuring a steady rise in the people's standard of living are bound up with the need to augment the volume of production. This in turn presupposes an increase in the production of physical resources. Their relative share in the gross social product exceeds 50 percent. This vividly demonstrates the dependence of the rise of efficiency of social production on optimum use of raw materials, supplies, fuel and energy, on thorough and comprehensive processing of minerals, and on broader use of secondary physical and energy resources. On the scale of the entire country a savings of 1 percent on material costs is equivalent to a growth of 7 billion rubles in the national income.

Specific measures to radically improve the effort at utilization of physical resources and to guarantee their conservation in every way have been defined in the decree of the CPSU Central Committee and USSR Council of Ministers entitled "On an Intensified Effort at Conservation and Optimum Utilization of Raw Materials, Fuel and Energy, and Other Physical Resources," dated 30 June 1981.

Performance of the measures outlined has made it possible in the 4 years of the 11th Five-Year Plan to save 6.6 million tons of rolled products of ferrous metals, 7.0 million tons of cement, 12.0 million cubic meters of timber and lumber, and a savings on fuel and energy resources amounting to more than 190 million tons of standard fuel.

As a rule the conservation of physical resources pursues the following principal directions: reduction of the materials intensiveness of designs, improvement of the quality of the product produced, comprehensive utilization of the raw material, reduction of standard rates of consumption of physical resources, use of new economical materials, replacement of expensive and scarce materials, introduction of progressive technology that conserves resources, and increasing the readiness of materials supplied for the production process.

Progressive collectives have acquired constructive experience in conservation of raw materials, supplies, fuel and energy while at the same time improving product quality. Good results have been achieved where economic managers and party, trade union and Komsomol organizations have been pursuing this effort purposefully and every day on the basis of widespread adoption of scientific-technical advances and where all the workers have become involved in it.

Assigning Standard Physical Inputs

An important role will be played in guaranteeing the internal consistency of plans and backing up the economy regime by the development of a progressive

set of standard inputs of physical resources and their constant improvement on the basis of application of advances of scientific-technical progress.

The standard rates of consumption fix the maximum permissible inputs of the relevant physical resources for the production of a unit of the product or per work unit. They constitute the computational base for planning the distribution of physical resources at all levels--from the production section to central planning authorities.

The level of the standard rates of consumption characterizes the level of efficiency of the utilization of physical resources, which depends above all on improvement of designs and technology and along with the planned volume of output of products and work predetermines the need for physical resources to guarantee fulfillment of the state plan's targets.

The standard rates of consumption of raw materials, supplies, fuel, thermal energy and electric power per unit product (work) must be progressive and technically and economically sound, must correspond to the level of advanced technology and the organization of production, and must ensure a reduction in the expenditure of physical resources and a rise in production efficiency.

State plans for economic and social development furnish targets for the average reduction of rates of consumption and conservation of physical resources. Beginning in 1983 these targets are set by the USSR Council of Ministers.

For the enterprises which have been converted to operation in the context of the economic experiment a set of interrelated measures has been envisaged to enhance their responsibility for optimum and economical consumption of raw materials, supplies and fuel.

The 5-year plans in a number of branches of industry set the following along with other indicators:

i. the maximum level of costs per ruble of marketed output;

ii. targets for the average reduction of specific inputs for the principal types of materials and fuel and energy resources per million rubles of marketed output and of the standard rates of their consumption;

the following are set in annual plans:

i. the maximum level of costs per ruble of marketed output;

ii. allocations for the principal types of material and technical resources;

iii. targets for the average reduction of standard rates of consumption of finished rolled products, steel pipe, cement, timber and lumber, boiler-furnace fuel, thermal energy, electric power, diesel fuel and motor gasoline;

iv. targets for raising the coefficient of utilization of finished rolled products of ferrous metals.

Incentives for Conservation

The experiment makes provision for measures which are supposed to motivate enterprises to reduce the consumption of physical resources. The formation of material incentive funds depends on this. For instance, the rate of growth (reduction) of the incenetive fund in the Ministry of Electrical Equipment Industry is as a rule set for 1984 and 1985 at 5 percent of that fund as stated in the plan of the base year for every percentage point of reduction (increase) of costs per ruble of marketed output.

If the planning targets for reduction of costs per ruble of marketed output are overfulfilled (underfulfilled) during the year (by quarters) additional deductions (reduction of deductions) from profit are made cumulatively from the beginning of the year to the material incentive fund at rates established in accordance with the regulation in effect, reduced (raised) by at least 30 percent. Moreover, these additional deductions (reduction of deductions) are made at rates stated in percentages of the total size of the material incentive fund called for in the annual plan for the period corresponding to the time that has passed since the beginning of operation in the current year.

Satisfaction of the economy's requirements for the products it needs depends in large part on improvement of product quality, reliability, durability, service life, economicalness and manufacturability. In order to motivate the production associations (enterprises) operating under the conditions of the experiment to produce products of that kind, a definite dependent relationship has been established between product quality and the building up of incentive funds.

The absolute size of deductions to the material incentive fund may increase as a function of the additional profit which production associations (enterprises) obtain from incentive supplements to wholesale prices for highly efficient new products whose parameters are up to the best Soviet and foreign models and for products bearing the state Quality Emblem. The funds obtained are used according to the advance estimate of expenditure of the material incentive fund, which has been taken up and approved by the work collective.

In certain ministries additional transfers to the material incentive fund which depend on product quality and the efficiency of products they produce have been established so as to take into account the particular aspects of the operation of enterprises. For instance, for combines (enterprises) of the USSR Ministry of Ferrous Metallurgy participating in the economic experiment additional transfers to the material incentive fund in a proportion not to exceed 50 percent of the value of metal saved in the national economy by increasing the production of economical products over the previous year with the production capacities in place may be made out of planned profit in order to increase the motivation to increase the output of economical, scarce and labor-intensive types of metal products.

One of the important opportunities for conservation of physical resources in the economy is the multiple use of the raw material at minimum costs to produce the relevant products and the widespread utilization of production waste.

The decree of the CPSU Central Committee entitled "On Serious Shortcomings in the Use of Secondary Physical Resources in the Economy" set ministries, departments and councils of ministers of union republics the task of increasing the relative share of secondary physical and fuel-and-energy resources used.

In ferrous and nonferrous metallurgy and other sectors of the economy it is possible in connection with the production of the principal products which give them their configuration to extract at the same time from the initial raw material dozens of chemical elements which might be the basis for secondary production of various products the economy needs.

The dependence of economic incentives on utilization of production waste and extraction of accompanying products in the mining of minerals has been established for all combines (enterprises) in ferrous metallurgy in order to solve these problems in the context of operation according to the economic experiment. For instance, the Magnitogorsk Metallurgical Combine and the Sokolovo-Sarabay Mining and Ore-Dressing Combine have been allowed to transfer to economic incentive funds up to 50 percent of the profit obtained from selling accompanying minerals mined, from multiple use of the mineral raw material, country rock, waste from ore dressing and from reduction of losses of minerals exceeding the standards assigned.

Beginning in 1985 the product which combines (enterprises) of USSR Ministry of Ferrous Metallurgy obtained from sales of products for production and technical purposes manufactured from production waste over and above the level achieved in the previous year is to be earmarked--up to 60 percent, for expansion of the plant and equipment for production of that product, up to 35 percent--for the awarding of bonuses to personnel, and up to 5 percent is to be credited to the fund for social welfare and cultural programs and housing construction.

Working Capital Consisting of Fuel and Materials in the Sectors of the Economy (at the beginning of the year, billions of rubles)

Indicator	1981	1984
Total	321.9	417.1
Breakdown:		
Industry	115.9	147.5
Agriculture (sovkhozes and other agricultural production enterprises)	35.7	43.9
Transportation and communications	5.1	7.3
Construction (construction contracting organizations)	55.4	72.3
Procurements	9.7	11.4
Supply and sales	16.1	20.3
Trade	68.9	93.6
Other sectors	15.0	20.8

Relative Share of Material Costs (Not Including Depreciation) in the Total Volume of Industrial Output (in comparable prices; not including the turnover tax; in percentages)

Indicator	1981	1983
Entire industrial sector	63.1	62.6
Electric power industry	48.9	50.6
Fuel industry	47.9	49.0
Chemical and petrochemical industry	57.2	56.5
Machinebuilding and metal manufacturing	53.8	52.6
Building materials industry	60.7	60.7
Light industry	80.2	79.6
Food industry	82.3	82.6

Increasing the economy's efficiency depends in large part on speeding up the rate of turnover of working capital and on reducing unproductive stocks of commodities and supplies. In order to enhance the responsibility of production associations (enterprises) for optimum utilization of fixed capital ministries participating in the economic experiment have been extended the right to introduce an additional charge, over and above the charge established and transferred to the budget, for above-allowance inventories of merchandise and supplies not being financed with bank credit and above-allowance stocks of uninstalled equipment not financed with credit.

The additional payment has been set for production associations (enterprises) in a proportion up to 3 percent of the value of the above-allowance stocks of commodities and supplies and uninstalled equipment not financed with bank credit regardless of the assigned rate of the charge on capital and even if there is a complete exemption from payment of the charge on capital into the budget. The payment is made out of actual profit remaining at the disposition of the production associations (enterprises) before it is used to build up the financial reserve of the production association (enterprise), and it is used to finance the ministry's expenditures whose need arises in the course of plan fulfillment.

In 1984 the performance of measures to ensure optimum and economical use of physical resources produced a savings on physical outputs in the proportion of 0.5 percent of the planned production cost for the Ministry of Heavy and Transport Machinebuilding as a whole, 0.7 percent for the Ministry of Electrical Equipment Industry, and 0.4 percent for the UkSSR Ministry of Food Industry, 0.7 percent for the BSSR Ministry of Light Industry and 0.2 percent for the LiSSR Ministry of Local Industry. In these ministries (except for LiSSR Ministry of Local Industry) physical inputs per ruble of marketed output decreased.

The reduction of stocks of uninstalled equipment at warehouses at capital investment projects between 1 January 1984 and 1 January 1985 decreased 4.5 percent in the Ministry of Heavy and Transport Machinebuilding, 21 percent in the UkSSR Ministry of Food Industry and 36 percent in the LiSSR Ministry of Local Industry.

By the end of 1984 remaining above-allowance inventories of uninstalled equipment had been reduced in all ministries, including by approximately one-third in Mintyazhmash [Ministry of Heavy and Transport Machinebuilding] and UkSSR Minpishcheprom [Ministry of Food Industry]. But still all the potential has not been utilized, so that targets for the conservation of raw materials, supplies and fuel were not fulfilled. For instance, on the basis of the results in the first three quarters of 1984 Minelektrotekhprom [Ministry of Electrical Equipment Industry] fulfilled targets for only five of the eight types of physical and fuel-and-energy resources on which targets are assigned, and Mintyazhmash for only four. In all ministries participating in the economic experiment there was overexpenditure of fuel and energy resources in excess of the standards established.

In a number of cases the ministries have set for subordinate enterprises excessively high standard rates of consumption of raw materials, fuel, energy and materials. For instance, having been given a target of 3.3 percent for the average reduction of rates of consumption of rolled pipe set for subordinate enterprises 1984 targets for reducing the standard rates of consumption by 1.7 percent, while the respective figures were 2.5 and 0.6 percent for rolled copper products. Minelektrotekhprom broke down assignments for reduction of standard rates of input of aluminum rolled products in the proportion of 2.4 percent when it had been assigned the figure of 3 percent. It is evident that the effort has to be continued to create a more effective economic mechanism for putting pressure on enterprises which allow overexpenditure of physical resources.

Progressive Forms of Supply to Associations (Enterprises)

A most important part of the further improvement of the supply of materials and equipment to the economy are the optimum organization and improvement of business relations, by which is meant relations between production associations (enterprises), combines and organizations concerning exchange of the products of their labor.

The level of satisfaction of the need of enterprises for products of a particular quality and by the dates that best suit the pace of production and the calendar schedule for putting the optimum production runs of the product to be consumed into production depends in large part on the operative system and structure of business relations.

The structure of business relations directly influences optimum use of physical resources and the application of economical materials in production, as well as the level and rate of turnover of aggregate product stocks. It largely determines the shipping and storage costs of products and other expenses charged to distribution costs.

When the need for a product is stable, especially that of enterprises engaged in mass production and production in large series, the optimum relations are those which remain in effect for a long time (mostly over the 5-year period); these relations afford the possibility of consistently improving product

quality, perfecting the technology for the product's production, stabilizing the conditions for supply and sales, reducing the levels of physical stocks, applying specialized and progressive types of packaging, and ultimately raising production efficiency.

Business relations concerning product deliveries can be established without any sort of participation of supply-and-sales organizations in the statewide system for the supply of materials and equipment. Such relations are established on a decentralized basis between the supplier and the consumer.

Business relations related to deliveries of means of production, which are established with the full participation of supply-and-sales organizations, are short-term in nature and as a rule do not extend beyond the limits of 1 year. The delivery of products in connection with these relations takes place on the basis of job orders of USSR Gossnab.

Supply-and-sales components also assign consumers to suppliers for a lengthy period of time, the 5-year period as a rule, communicate to them approximate volumes of deliveries of products for a consolidated (group) nomenclature in a breakdown by years. All other conditions of deliveries, including the quantity of products to be delivered in the detailed assortment, and specialized requirements concerning product quality are defined in long-term business contracts concluded directly between consumers and suppliers. Production relations of this kind are called direct long-term business relations.

Direct business relations have become more and more widespread under the conditions of the economic experiment. The reason for this is that they are one of the most progressive forms of the supply of materials and equipment to production enterprises. Organizing relations of this kind gives enterprises a number of advantages over the establishment of annual (semiannual or quarterly) relations in the framework of job orders and schedules of allocations. In general terms these advantages lie in the fact that these enterprises have the right, within the limits of the assigned volume of deliveries indicated in the plan for assignment of the consumer to the supplier, without participation of supply-and-sales components, to agree on the assortment (list) of products to be delivered and also the special requirements as to their quality and design features. This makes it possible for enterprises to obtain the products they need and to obtain deliveries of them in the form best prepared for the consumer.

The transition to long-term direct business relations creates the following opportunities for enterprises:

i. to draw up for the future a plan for loading the available productive capacities;

ii. to determine in advance the need for raw materials, the prospects for development of their own production for the purpose of maximum satisfaction of the customer's requirements;

iii. to render mutual services related to production and organization aimed at conservation of physical resources;

iv. to agree on dates when the consumer will submit detailed lists for product deliveries or for amendment of those lists;

v. to ensure delivery strictly according to a schedule that is adjusted to the pace of production, which makes it possible for consumers to avoid building up excessive inventories of products, unjustified interruptions in operation and the consequent crash effort and rejects that entails;

vi. to agree on conditions for the packaging of products, to engage in joint development and application of specialized forms of reusable containers.

At the present time 23 percent of products for production and technical purposes, amounting to 2,800 product designations, sold through the system of USSR Gossnab, are covered by direct long-term business relations.

Practically all associations (enterprises) with large-series production in the industrial sector have now been converted to these relations. At the present time 11,300 production associations and consumer enterprises are receiving products from 6,000 suppliers on the basis of these relations, totaling more than 40 billion rubles per year.

For many production enterprises direct long-term business relations are becoming the predominant form of the supply of materials and equipment. For instance, the "GAZ" [Gorkiy Motor Vehicle Plant] Production Association obtains about 1,000 types, grades and sizes of rolled metal products on the basis of long-term contracts, including 94.7 percent of the calculated volume of hot-rolled steel sheet used in making machinery, 96.4 percent of the high-grade machinery steel, and more than 50 consolidated designations of chemical products and many other products.

Preparation for and conclusion of long-term contracts are an important condition of successful operation according to direct long-term business relations. By contrast with annual contracts, they stipulate the delivery conditions, which are feasible only as a result of the long-term cooperation between the consumer and the manufacturer, specifically: broadening the assortment and introduction of progressive new products to be delivered on the basis of customer orders, improvement of product quality and increasing the product's technical and economic indicators (performance characteristics).

Experience shows that thanks to properly adjusted direct relations many enterprises are achieving quite good results in conservation of physical resources and in cutting back inventories. This experience should be used extensively at enterprises where the experiment is being conducted. For instance, the Kiev Plant imeni Lepse has included in contracts with suppliers additional conditions that stipulate the obligations of the parties related to expansion of the product list (assortment) of products consumed. This led to improvement in the quality of the product manufactured, a savings of 300 tons of

metals, a reduction of product cost by 45,000 rubles, and a noticeable reduction of rejects. The pinpointing of delivery dates has made it possible to improve the use of equipment and to cut back idle time of less than one shift by 320 hours.

The "Gomsel'mash" Production Association, which has direct long-term business relations with the plant "Zaporozhstal'" and with the Dnepropetrovsk Metallurgical Plant imeni Petrovskiy, achieved an economic benefit of 146,500 rubles per year because it received economical shapes of rolled products in accordance with agreed specifications and this led to a reduction in the machining of the metal.

Steady delivery of portland cement to the Klin "Stroyindustriya" Combine, which since 1973 has maintained direct long-term business relations with the Pikalevo "Glinozem" Association, made it possible to improve the technology for the production of reinforced concrete, to improve its quality, to reduce the percentage of rejects, and to shorten the length of heat-moisture treatment of the products by an average of 7 percent.

The Zaporozhye "Kommunar" Motor Vehicle Plant reduced the level of production stocks as follows during the 11th Five-Year Plan because suppliers kept precisely to contract conditions: rolled metal products from 16,500 to 8,200 tons, thin-wall seamless steel pipe from 112,000 to 24,000 meters, thin-wall electrowelded pipe from 933,000 to 392,000 meters, and steel strip from 1,076 to 573 tons.

It is possible to stipulate such conditions in contracts as mutual financial liability for nonfulfillment of the obligations assumed and the procedure of mutual settlement for products delivered and services rendered.

The experience gained in developing various forms of the supply of materials and equipment has also made it possible to detect a number of essential shortcomings and difficulties making them less effective. Supply-and-sales organizations, ministries and departments often make changes in the size of deliveries under direct relations and allow substitution of suppliers, which disrupts the rhythm of product shipment and results in nonfulfillment of contractual obligations.

Under the conditions of the experiment it is very important to carry out a set of interrelated measures for further expansion of direct and long-term business relations and to make them more permanent and effective. To that end components of USSR Gossnab and ministries and departments are drafting a 5-year plan for development of such relations over the period 1986-1990.

That effort has taken the following principles as its basis:

1. provision is made to preserve the existing business relations which are economically worthwhile for enterprises with large-series and large-scale production and to see to their further expansion;

ii. for all products except cement and certain types of timber and lumber the norms for conversion of enterprises to direct relations have been reduced to four transit norms per year (at the present time there are at least 12 transit (freight car) norms for ferrous and nonferrous metals, pipe and general metal goods, 17 transit norms for cement and 20 shipping norms for timber and lumber). The standard of 12 transit norms has been established for cement, 20 for commercial timber and 4 shipping norms for quality lumber and other wood products;

iii. ministries and departments have been given a greater role in preparing the draft plan for development of direct relations by years of the 12th Five-Year Plan in its sectoral and regional breakdowns and also in monitoring the conclusion and performance of long-term contracts for delivery of products by their subordinate enterprises;

iv. the content of direct long-term business relations concerning delivery of products for production and technical purposes has been broadened. They also propose inclusion of catalogue (imennikovoye) equipment and other types of products with a lengthy manufacturing cycle produced on the basis of direct orders from consumers;

v. in order to guarantee more reliable supply of consumers, so that they regularly receive products in nontransit quantities through enterprises of the system of USSR Gossnab, provision has been made to substantially expand the conversion of these enterprises to long-term business relations with product manufacturers.

Provision has been made to single out a separate section in the 5-year plan for development of long-term business relations of supplier enterprises with the associations (enterprises) which are manufacturers. By way of an experiment a procedure has been introduced in 5-10 enterprises of Minstankoprom [Ministry of Machine Tool and Tool Building Industry] and Minsel'khozmash [Ministry of Tractor and Agricultural Machinebuilding] which have been converted to the economic experiment, for formation of detailed (assortment) production plans in accordance with the contracts and orders of consumers with whom they have direct long-term business relations. Study is also being given to the question of the feasibility of ministries and departments allocating physical resources to their subordinate associations and enterprises for the entire 5-year period with a breakdown by years. Since a comparatively limited number of associations and enterprises are being converted to the direct long-term relations, but precisely those which have a large relative share in the total volume of consumption of resources, this measure is quite realistic and would be an important step toward further enhancement of the role of 5-year plans for product distribution in the planning of the supply of materials and equipment.

Strengthening Delivery Discipline as a Condition for Highly Efficient Operation

Strengthening the discipline in delivery of products at the present scale of social production is an exceedingly important condition for the smooth functioning of the economy and of all its links.

The decree of the CPSU Central Committee and USSR Council of Ministers entitled "On Serious Shortcomings in Performance of Contractual Obligations Related to Product Deliveries and Enhancement of the Responsibility of Ministries, Departments and Enterprises in This Matter," adopted in April 1983, has great importance to reinforcing discipline of product deliveries.

The decree stresses that one of the most important tasks of economic, party and Soviet authorities is to institute strict procedure and discipline in the observance of contract obligations related to product deliveries. Performance of deliveries must be one of the principal indicators of the performance of sectoral ministries, production collectives and their managers. The unfulfillment of product deliveries according to contract, the decree points out, must be treated as a serious violation of plan discipline and state discipline. It recommends that ministries and departments monitor more closely the operation of subordinate enterprises, take effective measures toward timely and complete fulfillment of contractual obligations concerning intersector deliveries under cooperative arrangements, and do not allow production of products which have not been ordered and which are not in demand and prevent the use of physical resources for other than their assigned purpose.

The need which has been noted to strengthen the organizational work to reinforce production discipline and work discipline and to link it directly to the performance of planning targets and contractual obligations is guided by the fact that the effort of all work collectives in the country stands in a close economic relationship, so that an interruption of deliveries in one link disrupts the pace of production in related enterprises.

Party organizations, the decree points out, must make fuller use of their right to monitor the performance of the management and to insistently enhance the role of work collectives and the responsibility of every worker of the enterprise in this manner.

Evaluation of the economic performance of production associations (enterprises) operating under the conditions of the experiment takes into account fulfillment of planning targets with a volume of sales on the basis of obligations to make deliveries in accordance with a product list (assortment), to a standard of quality and by deadlines in accordance with contracts (orders) concluded.

The essence of this indicator is that it includes the value of only those products which are delivered to consumers in conformity with contracts. If there are even the slightest shortages in contract deliveries, then any sales over and above the contract are not included in the reported figures. In that context the actual volume of sales so as to take into account fulfillment of

contractual obligations is calculated as the difference between the planned volume of sales and the value of products not delivered in conformity with contracts.

Fulfillment of the Plan for Sales so as To Take Into Account Contractual Obligations for Product Deliveries (in percentage)

Indicator	1985 (January-February)
Industrial sector as a whole	96.70
Breakdown:	
Seven machinebuilding ministries converted to the experiment	98.30
Six union-republic ministries of light industry of the union republics converted to the experiment	99.40
Six union-republic ministries of the food industry of union republics converted to the experiment	99.98
BSSR Minmyasomolprom [Ministry of Meat and Dairy Industry]	99.98
RSFSR Minrybkhoz [Ministry of Fishing Industry]	98.80
Enterprises of RSFSR Minmestprom converted to the experiment	98.30
Enterprises of UkSSR Minmestprom converted to the experiment	98.70
LiSSR Minmestprom	100.00

The conditions of the economic experiment assume that production associations (enterprises) will have greater incentives and greater responsibility for prompt and complete fulfillment of contractual obligations concerning deliveries. The absolute size of transfers to the material incentive fund of such enterprises during fulfillment of annual plans can now be increased or decreased depending on fulfillment of the plan for sales so as to take into account obligations concerning deliveries in accordance with contracts concluded and job orders accepted for fulfillment.

For each percentage point of underfulfillment of the plan for contractual obligations related to deliveries the material incentive fund is decreased by 3 percent. When contracts are completely fulfilled, the material incentive fund is increased by 15 percent. The increase of the material incentive fund for that indicator is charged to the portion of profit remaining at the disposition of production associations (enterprises), and if it should be insufficient, then payments from profit into the budget are reduced to make up the difference.

Strengthening the role of the indicator of fulfillment of deliveries under the conditions of the experiment is making it possible to improve the fulfillment of contractual obligations and to improve the balance in the national economy. Enterprises are becoming considerably less motivated to produce so-called "profitable" products (those which are materials-intensive or have a higher rate of profitability).

Enhancement of this indicator's role has made it possible to achieve good results in economic performance. In 1984 enterprises of Mintyazhmash fulfilled contractual obligations for deliveries at a level of 99.2 percent, as against 94.5 percent in 1983, when the ministry was not participating in the experiment. In Minelektrotekhprom fulfillment of this indicator was 99 percent and 96.9 percent, respectively.

Enterprises of UkSSR Minpishcheprom, BSSR Minlegprom and LiSSR Minmestprom completely carried out their assignments for deliveries in 1984.

As a rule operational and production planning and technical-and-economic planning is being restructured in associations and enterprises completely fulfilling the orders of consumers. Intraplant staff services are orienting their effort toward ensuring a uniform pace of output. Good experience in this direction has been gained in the following associations: Ternopol "Vatra," Kursk "Elektroapparat," "Riga Power Machinebuilding Plant," and the Novokramatorsk Machinebuilding Plant.

In the Minsk "Komsomolka" Garment Production Association a special production scheduling service has been set up and is equipped with an electronic computer. It has become the leading unit in managing the entire production cycle. Every day it monitors fulfillment of the principal indicators by shops, sections and brigades. In addition, a staff service exclusively concerned with deliveries has been set up within the limits of the assigned limit on the number of administrative and managerial personnel. Its principal purpose is excellent and prompt performance of the association's contractual obligations.

The collective has concluded contracts for creative cooperation with related enterprises which call for a smooth pace of delivery of raw materials to the association and of finished products to customers. The conditions of the contracts include supplements on material incentives of related enterprises for delivery of raw materials which make it possible to manufacture new high-quality products. All of this has afforded the collective the opportunity to achieve a smooth pace of production and to handle successfully the obligations it has assumed.

At the same time the procedure for determining the indicator used to evaluate performance of enterprises for fulfillment of contractual obligations related to product deliveries needs further improvement. At the present time there is a widespread effort at enterprises to fulfill the planning targets for 1985 and the socialist obligations assumed. Everywhere there is a search going on for additional opportunities to raise the productivity of labor and to strengthen the economy regime. Many enterprises have adopted the obligations to work 2 days with resources which have been saved. The measures taken to improve the supply of materials and equipment within the framework of the experiment will be contributing to performance of these tasks.

Responsibility of Entities in the System for Material and Technical Supply

Under the conditions of the experiment entities in the system for material and technical supply have greater responsibility for prompt and comprehensive supply of physical resources to production associations (enterprises).

Supply plans are carried out through glavsnabsbyty [main administrations for the supply and sale of particular products] and regional entities for material and technical supply, most of which are under the jurisdiction of USSR Gossnab.

Within USSR Gossnab there are 29 soyuzglavsnabsbyty and 12 soyuzglavkomplekty [main administrations for comprehensive delivery of all supplies and equipment to enterprises in particular industries], 14 union-republic gossnabs and 31 main regional administrations.

The regional entities of USSR Gossnab bear joint responsibility with enterprises for linking the production plan to material and technical resources, to take steps to furnish raw materials, supplies, articles and other necessary products to enterprises, and to promptly issue orders and plans for assignment of consumers to suppliers for the delivery of products in accordance with the stocks allocated.

Supply-and-sales organizations, gossnabs of the union republics and main regional entities of USSR Gossnab must give shape to their relations with production enterprises by concluding contracts. They must make provision for expanding the guaranteed comprehensive supply of consumers and for increasing the volume and types of services rendered, including the services to prepare the product for productive consumption, centralized delivery of products on the basis of coordinated schedules, the renting of pieces of equipment, and the sale of above-allowance and unused inventories.

The gossnabs of the union republics and the main regional administrations of USSR Gossnab must in the cases necessary and for the purpose of better supply of enterprises see that long-term contracts are concluded with them to organize the supply of materials and equipment. They must stipulate a measure of liability for nonfulfillment of the obligations assumed.

In dealing with the problems of furnishing materials and equipment to enterprises the regional entities make provision when necessary for supplemental allocation of physical resources to retool production being financed from the production development fund, depreciation, bank credit and profit. Enterprises are allowed to release physical resources over and above the stocks allotted to them which have been duly put into economic circulation on the basis of above-allowance and unused physical inventories, according to the list of the state plan, USSR Gosplan, USSR Gossnab and also products procured on a decentralized basis.

When necessary the regional entities of USSR Gossnab must make decisions to move up the deadlines for delivery of products to enterprises within the limits

of the stocks allocated to them, to see that such deliveries are made out of the physical working capital at subordinate enterprises resulting from product deliveries, on regulation of transit deliveries to consumers who have above-allowance stocks of products of the same kind and by borrowing products from other enterprises. In certain cases regional entities may make decisions at the request of ministries to advance products to enterprises against the next year's stocks.

When recommendations come in from enterprises concerning exchange of certain types of supplies, raw materials and products, the regional entities must be responsive in examining them and making the proper decisions within a 3-day period and must make broader use of physical working capital of enterprises related to product deliveries for those purposes. The regional entities of USSR Gossnab may also meet a production need by exchanging products of the same kind with enterprises which are in the jurisdiction of other regional entities.

Entities of USSR Gossnab have been set the task of furnishing a great deal of aid to production enterprises in selling their products, especially in small lots in nontransit quantities.

Under present conditions there has been substantial enhancement of the role of state arbitration entities. In resolving business disputes they are expected to exert vigorous pressure on enterprises, associations and organizations so as to ensure that they observe socialist legality, fulfill planning targets and contractual obligations, wage a fight against manifestations of localism and departmentalism in economic activity, unswervingly apply the measures of financial liability set forth in legislation or contract for violations of state discipline that occur in connection with fulfillment of planning targets and contractual obligations.

Four hours have been allocated to studying the fourth topic, including 2 hours for the seminar or workshop. The purpose of the workshop is to study problems in organizing the optimum business relations and stable supply under the conditions of the experiment, the transition of associations and enterprises to direct long-term business relations, and enhancement of the role of business contracts. Paramount attention should be paid to the various aspects of strengthening delivery discipline, economical consumption of all types of physical resources, improvement of the interaction of all entities in the process of supply--transport--production, strengthening the incentives of enterprises for strict fulfillment of obligations related to deliveries, and analysis of the performance of the collective in the first 3 months.

When papers are prepared for the classes it helps the students to assimilate the subject matter better.

Suggested paper topics:

1. Organizational and technical measures to improve the management of the supply of materials and equipment in the sector, association (enterprise).

2. Experience of associations (enterprises) on the basis of direct long-term business relations, organization of production and sale of products in order to fulfill business contracts.

3. Forms for the participation of work collectives and specialists of various staff services of enterprises in the campaign for optimum use of physical resources and for reduction of the specific rates of their consumption.

Efficient organization of the supply of materials and equipment and strict observance of contract discipline promote a rise in the efficiency of production, successful fulfillment of planning targets and socialist obligations, and creation of a sound foundation for a successful start in the 12th Five-Year Plan.

[Box, p 12]

Fulfillment of Contractual Obligations for Product Deliveries by Ministries Operating Under the Conditions of the Economic Experiment in 1984

The plan for sales taking into account contractual obligations was fulfilled as follows:

Ministry of Electrical Equipment Industry

Deliveries according to contracts were fulfilled by 77.3 percent of enterprises using the indicator of 100-percent fulfillment of contractual obligations.

The following had the best figures for the regularity of deliveries: Saran "Svetotekhnika" Association, Kursk "Elektroagregat" [occurs elsewhere as "Elektroapparat"] Association.

Ministry of Heavy and Transport Machinebuilding

Deliveries according to contracts were fulfilled by 56.5 percent of enterprises using the indicator of 100-percent fulfillment of contractual obligations.

The following had the best figures for the regularity of deliveries: "Zhdanovtyazhmash" Association, Barnaul Transport Machinebuilding Plant imeni V. I. Lenin.

UkSSR Minpishcheprom

All 260 enterprises completely fulfilled contractual obligations.

The following had the best figures for the regularity of deliveries: Lvov "Svetoch" Association, Zaporozhye Beer and Nonalcoholic Beverages Association.

BSSR Minlegprom

All 66 enterprises completely fulfilled contractual obligations.

The following had the best figures for the regularity of deliveries: Orsha Flax Combine, Pinsk Spinning and Knitting Association.

LiSSR Minmestprom

All 21 enterprises completely fulfilled contractual obligations.

The following had the best figures for the regularity of deliveries: "Neringa" Cultural Goods [recreational, educational, hobby and sports goods] Association, "Vil'nis" Association for Containers and Packaging, "Atrama" Pilot Mechanization Equipment Plant.

[Diagram, p 11]

Structure of USSR Gossnab

Key: 1. USSR Gossnab
2. Central authorities of USSR Gossnab: Soyuzglavsnabsbyty; Soyuzglavkomplekty
3. Regional entities of USSR Gossnab: Main regional administrations of USSR Gossnab; Gossnabs of union republics

Key to diagram (continued)

4. Supply-and-sales associations, administrations, departments, enterprises for product deliveries (general-purpose, specialized), wholesale stores
5. Associations, administrations and enterprises for procurement and processing of secondary resources
6. Container-repair and timber trade enterprises and organizations

7045
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RESOURCES UTILIZATION AND SUPPLY

IMPROVED NORMS OF MATERIAL RESOURCE STOCKS SOUGHT

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA EKONOMICHESKAYA in Russian No 2, Mar-Apr 85 pp 58-65

[Article by V. N. Davydov and L. S. Danilenkov: "Methodics Questions on Improving the Setting of Norms for Production Reserves of Material Resources"]

[Text] The article examines problems of improving the methodological and methodics bases for the forming and utilization of production reserves at all levels of industrial-production planning. The necessity for replacing the existing methodics for setting production-reserve norms with more improved ones, which will enable a norm's value to depend directly upon the prescribed level of reliability (or continuity) of the production process, is pointed out. The principle that norm-forming factors must be oriented to plan indicators, which, in the authors' opinion, will promote a substantial reduction in the labor consumed in computing norms and an increase in timeliness in the introduction thereof into the ministries' and agencies' work practice, is introduced.

One of the most important areas in meeting the goals of converting the country's economy to the intensive-development path and of strengthening orientation to increasing production output faster than materials are consumed is the creation of a scientifically substantiated standards base for social production, consumption and distribution.

The USSR Gosplan decree of 11 January 1980 approved a procedure for developing and confirming a system of progressive technical and economic norms and the standards and measures for introducing it [2]. The system is an aggregate of norms and standards for labor expenditure, the consumption of raw and other materials and of fuel and power, the utilization of production capacity, capital investment, raw-materials reserves, fuel and finished goods, and so on.

The existing methodics developed for setting production-reserve norms concern those supply and equipment stocks which come to the users but have not been reworked yet. Appropriate norms for planning such reserves and for monitoring actual surpluses of them are being developed and approved. It must be noted that there are tendencies to identify the act of setting production-reserve norms as being of deep local significance, while it is, as a matter

of fact, a most important element for planning the whole economy. When working out inventories and plans for distributing supplies and equipment within annual and five-year plans, the development of production-reserve norms emerges as the setting of norms for carryover reserves, the amount of which is set for the end of the year being planned. This amount, in being included in the system of plan indicators for material inventories, serves as a reflection of the reproduction of the social product and as the establishment of a quantitative correspondence between the forming of material resources by supply source and the distribution thereof by consuming area.

In the methodics documents now being used, the average reserve during the year of raw and other materials that are used for production purposes is taken as the amount of the production-reserve norm. However, in our view, because of inadequate scientific substantiation, such an approach in determining the magnitude of a norm cannot satisfy the requirement of modern production practice. Aside from a number of other factors, imperfection of the methodics support for calculations and for evaluating the carryover-reserve norms, which leads in most cases to an overstating of the magnitude of supply and equipment inventories that have been allocated, is proof of this. According to USSR Gossnab data, on 1 June 1981 above-standard reserves worth 4.7 billion rubles were in storage within industry (in the consumers' storage facilities), and for the economy as a whole their value exceeded 6 billion rubles. Nationwide, reserves of resources doubled in the last decade, while the national income produced increased 1.6-fold. Along with other factors that caused the prevailing situation, errors in the methodics for evaluating carryover reserves when plans are developed for distribution among stocks managers and the main areas of use also played a role of no little importance.

In February 1982 the Interagency Commission on Saving Resources examined problems of the work of USSR Mintyazhmash [Ministry of Heavy Machine Building] in reducing above-norm reserves of valuable goods at subordinate enterprises and associations. The commission noted that reserves of raw and other materials and fuel were growing more rapidly than the increase in production volume, as a result of which a large "surplus" of metal, pipe and other materials had piled up. At some enterprises the "surpluses" of materials can satisfy the production facilities' annual requirement but nevertheless the supply services can still order and receive unneeded resources. During 1980 alone the unplanned turnover of such resources exceeded 15 percent of total consumption of the industry's plants [3]. Similar cases could be cited also for other branches. The Interagency Commission regularly requires ministries to bring reserves to the established standards and to transfer above-norm "surpluses" to supply-and-equipment organizations locally for sale and distribution in the prescribed procedure. But such a procedure threatens to be drawn out over a long period, since the norms themselves for reserves that are determined under the existing methodics are overstated as a rule, and, consequently, the level of "surpluses," which enlarge the unplanned turnover, proves to be above the established norms very quickly again.

It is known that the function of a production reserve is its capability to support continuity of production. In calling attention to this feature of the production reserve, K. Marx wrote: "In order that the production process may proceed continuously--absolutely regardless of whether this reserve is renewed daily or only after certain periods--the production facility must

keep constantly on hand a reserve of raw materials, and so on, that is larger than is required, for example, daily or weekly." [1] It follows from this that the indicator on the basis of which production-reserve norms are established should be based upon the requirement to support continuity of the production process, and a functional tie between them should be established.

The degree of production continuity can be determined by the amount of an enterprise's idle time that is caused by a lack of material resources, or the number of days per year when it is supplied with the necessary stocks (in other words, the coefficient of reliability in supplying the enterprise with reserves).

Under the given system of shipments and consumption of material resources, an enterprise's idle time depends directly upon the amount of the carryover reserve at the start of the plan year. The greater it is, the less the enterprise's idle time and the higher the level of reliability in supplying the reserve, and vice versa. In this case, there is of course, a limit at which, when it is reached, reliability stops increasing, and the reserve's utilization effectiveness drops. But the indicator of the annual average reserve, which is taken as the norm and which is determined without regard for the production facility's idle time, yields a less authentic result in establishing the production reserve's effective magnitude. It should be kept in mind that there is one more circumstance that affects precision in determining the norm which is taken to be the amount of the average annual reserve. It is known that the norm is determined basically as the sum of the current and the reserve stock components. The current component usually is associated with conditions marked by a full coincidence of deliveries and expenditures, the reserve-stock component with conditions that lack such a coincidence. Since each of the components is determined for a real condition of shipment and consumption of material resources that is far from each of the "pure" conditions indicated above (that is, in the first case there is not a full coincidence, and in the second there is not a complete lack of this coincidence of shipments and consumption), then the existence of a mutual crossing of these two components is obvious. Following from this, in turn, is a particular approximation of quantitative evaluations of the norm's value, based upon the algorithm that is used for computing the size of the average annual reserve.

Let us illustrate this with an example. Under the given conditions, the amount of the production-reserve norm is obvious. Thus, for large-series production, where there is an annual requirement for 12 shipment-unit norms, it cannot be more than 30 days, even in order to provide for a reliability equal to unity. In this case the monthly requirement is equal to one shipment-unit norm. The Statute on Shipments guarantees an obligation to provide the monthly requirement of one shipment-unit norm. Let us assume that the most unfavorable interval between shipments to an enterprise was 60 days: in one month delivery was made on the first day, and the next month on the last day. If prior to this the production reserve had been equal to 30 days (one shipment-unit norm), then on the first day of the first month after the shipment it now amounts to 60 days. During the first month, the material in the amount of one shipment-unit norm will have been expended, but another 30 days of material remains, that is, there will be enough for the whole second month. Thus, continuity of operation of the enterprise will be provided for. An analysis of the practice of setting norms for production reserves show that in this case the norm can reach 54 days.

An objective path for establishing norms for reserves for ministries, agencies and Union republics (the stocks administrators) is the consistent aggregating of specified norms, that is, individual norms of enterprises should form the basis of the aggregated indicator. Planning practice employs the sum of the average annual amounts of the reserves used at enterprises as the aggregated indicator. And, since the annual average amount of the reserve at each enterprise does not have an immediate, direct connection with the parameters that characterize continuity of the production process, such an indicator for it is still essentially arbitrary. Computing it within the framework of determining the magnitude of the norm is formalistic in nature. Moreover, since some of the norm-forming factors (the dates and variants of shipment amounts) are random in nature, the norm for the production reserve, which is determined from a limited sample (the data for one year), also is a random value. In the example indicated above for an annual requirement for 12 shipment-unit norms, the lower limit of change of the norm is 10 days, that is, it varies in the range of 10 to 54 days. If the amount of the carryover reserve at the start of the year being planned is taken as the enterprise's production-reserve norm that provides the necessary level for production continuity, and the norm is determined in accordance with a more representative sample, then the indicated contradictions are eliminated. Precision in determining the production-reserve norm of the enterprise and of the stocks administrator is increased.

Thus, in order to have a stricter tie of the value of an enterprise's (or stocks administrator's) norm with reliability in providing it with a reserve, it would be desirable to base it on the following determination of the production-reserve norm. That minimal value of the carryover reserve that will provide for continuity of an enterprise's production process in accordance with the prescribed level of reliability in providing the reserve should be taken as the norm for an enterprise's production norm. Such a determination presupposes a direct functional tie of the production-reserve norm's magnitude with the continuity characteristics of the production process--with the level of reliability of providing the reserve--and it permits USSR Gosplan, while taking a differentiated approch to evaluating the production-reserves requirements for various stocks administrators, to make alternative calculations for making decisions where there are limited amounts of supply and equipment resources.

Improvement in setting production-reserve norms should also, in our view, be made in the areas of considering the feedback of economic and social development plan indicators with the production-reserve norm, and of reorienting the norm-forming factors to the plan indicators. As has been noted already, the production-reserve norm is used in computing the plan indicators, particularly when developing materials inventories. There is also the feedback of the plan indicators with the production-reserve norm. It is known that the indicated norm now is computed on the basis of last year's data, so current-plan indicators do not affect the magnitude directly. At the same time, such indicators as, for example, the annual-plan requirement and the products mix in shipments of supply and equipment stocks are governing when computing production-reserve norms. Moreover, the method proposed for tying the norm's value in with current-plan indicators will be indicated. In particular, this tie-in could be realized through the indicators of the enterprise's annual specified requirement for supplies and equipment, which has been refined on the basis of the stocks that USSR Gosplan has allocated to the ministry. An orientation to plan indicators requires simultaneous reevaluation of the role of the

release of material stocks from storage (ordinarily received for consumption) as a factor in shaping the norm. Let us note that actual consumption and release are not one and the same. Frequently, the material is taken into the department from storage earlier, and this depends upon the availability of storage space in departments and upon other organizational measures not connected with materials consumption. For example, a certain amount of materials stocks is sent from storage not to a department but to other enterprises by way of exchange, and so on.

In our view, when solving the indicated questions one must proceed primarily from the fact that production-reserve norms are set in socialist-economy environments, the underlying principles of which are those of planning and evenness of production. In large-scale production of large series, planning is performed uniformly--by the quarter or by the month. The planned requirement is formulated as the product of the amount of articles produced during the year, the quarter and the month and the material-stocks consumption norm. The volume of schedule-orders for a material for the quarter is equal to the quarterly requirement, and the total amount of the shipments equals the quarterly schedule-orders issued. In considering the uniformity of shipments by month (in accordance with the Statute on Shipments), the monthly volume thereof should be equal to the planned monthly requirement for production. Thus, the total consumption of a material during the month should be equal to the monthly volume of shipments, assuming that the Statute on Shipments and the enterprise's production plan are being carried out. Under these circumstances only the dates and variants of shipments (for example, the monthly requirement is realized in the form of one or several shipments) can be changed. Therefore, data about issuances or actual expenditure of the material in this case are redundant. Let us assume that in a certain month the actual consumption was 50 percent of that planned. Can we assume such factual information about consumption on the basis of the computations? Probably not. Actual consumption in another month can turn out to be double that planned, and the use of such information would be nonuniform, since it is impossible to expend more resources than have been received. In both cases there is a departure from the planned nature of the change in consumption. The norm for the reserve cannot be computed on the basis of the indicated data. It, like any other norm, should be progressive, should provide for material-resources utilization effectiveness, and should not validate possible breaks in the regularity of the production process or of the supplying of materials and equipment, elevating these progressive features to the stature of law. Such an approach will in practice promote an overstating of the norms for reserves over that which which is objectively necessary. Thus the issuance (or consumption) of material stocks cannot be taken as a norm-forming factor without introducing distortions into the magnitude of the norm. Data on change in planned consumption must be used when computing the production-reserve norm. But, as indicated above, planned consumption is not an independent norm-setting factor but a function of the planned requirement for the schedule-ordering of material resources. For large-series production, planned consumption is identical by month of the year and does not affect the production-reserve norm's value.

Production of small series or of individual items will be marked by nonuniformity in change of the planned requirement for materials by quarter (or month) of the year, since the various articles are produced only within certain quarters. Therefore, in the given case, planned consumption will affect

the value of the norm for the reserve. Let us assume that planned consumption is the same in each month of the first and second quarters of the year, while in the third and fourth quarters that are two shipment-unit norms. Then, during the first half of the year, it suffices to have a reserve in the amount of one shipment-unit norm in order to provide for reliability equal to unity, since, according to the Statute, delivery of one shipment-unit norm during each month is guaranteed. Providing such reliability in the second half of the year will require that the production reserve be doubled, since planned consumption is doubled and the volume of one shipment-unit norm would suffice only for 15 days, not 30.

Extremely important areas for improving the setting of norms for production reserves of material stocks are the use of a limited amount of baseline information, a reduction in labor expenditure in computing the norms, and an increase in the timeliness of introducing them into ministry and agency practice. It is not enough that the methods for setting norms be effective: it is even more important that the results of computations of the norms, based upon the indicated methods, be introduced responsively in the ministries' and agencies' practice. The most precise methods for computing norms will not yield the needed benefit if their introduction is stretched out over many years. A dilemma arises here. On the one hand, one must be concerned about completeness of the content and the precision of the norm, and, from this point of view, one computes it on the basis of standard varieties and sizes of the material resources, since the basic norm-forming factors are realized only within the framework of consideration of parameters of this type.

On the other hand, computations of norms based upon standard varieties and sizes require the involvement of a large amount of baseline information from the ministry's enterprises. It is proposed that this contradiction be resolved in the following way. Work out ahead of time tables for setting the values of the specified norms in accordance with the known value of the enterprise's annual specified requirement and the prescribed level of reliability in providing the reserve. In this case, when determining the norms for a ministry's production reserve, a conversion directly to standard varieties and sizes is precluded, and the process itself of computing the norm for the stocks administrator is reduced to an aggregating of the specified norms. Thus, the content of the production-reserve norm will be preserved, and the amount of baseline information will simultaneously be reduced considerably, as will, consequently, the labor intensiveness of the calculations.

The areas for improving the setting of production-reserve norms that have been noted correlate well and are realized simply enough within the framework of simulated modeling. Simulated modeling is used widely in the study of complicated objects, for which change over a broad range in the structure of an object and of its characteristics, operating systems and external influences is characteristic. The ministry (the stocks administrator), together with the enterprises that comprise it and the processes of shipment and consumption of material resources that are characteristic of it, is precisely such an object. Simulation opens up broad possibilities for considering practically any number of norm-setting factors within the structure of the production-reserve form. If a tie of any kind of an indicator with the value of the norm, directly or through another indicator, has been established, such an indicator can be considered when developing the model for the norm-shaping

factor. It is necessary only that the chosen factor possess a sufficient degree of representativeness for the entire set of factors that influence the structure of the norm being developed.

In order to compute a specified production-reserve norm for an enterprise, the laws on the distribution of variants in amounts and in dates of shipments, and the planned nature of change in shipments must be considered, in addition to the annual specified requirement, which is expressed in shipment-unit norms, and to the level of reliability in providing the reserve. When computing the aggregate norms of a reserve, the following also are considered: the structure of the products-mix group (or the type) of supply and equipment resources in the cross-section of the standard varieties and sizes; and the number of enterprises comprising the ministry or agency.

The results of computing the specified norm on the basis of the norm-forming factors indicated are formulated in the form of a table for the specific amount of the annual specified requirement.

The annual specified requirement, the prescribed level of reliability in supplying the reserve, the shipment-unit norm for unloading, the structure of the level of the planning organs, the composition of the products-mix group (or the type) of material resources, and schedules for planned change in material-stocks consumption are published by higher authority. The laws of the distribution of dates and of variants in the amounts of shipments and the planned nature of change in material-resources consumption are established for 2-3 years on the basis of the existing statistics.

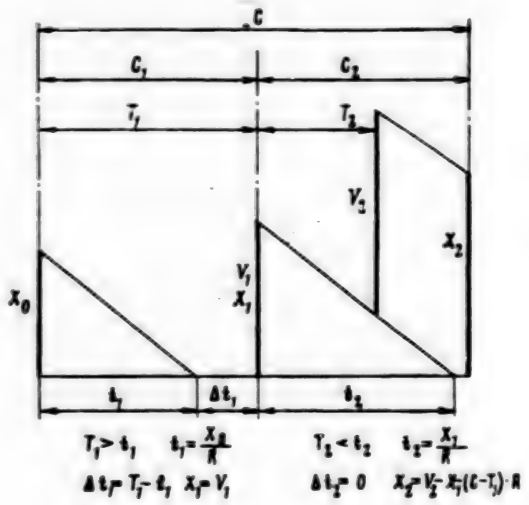
The specified annual requirement is determined in accordance with data of the specifications for material resources for enterprises for the stocks that are allocated by USSR Gosplan.

It is desirable that the level of reliability in providing the reserve be established by USSR Gosplan's Department of Norms and Standards. In accordance with the purpose of the production reserve, the baseline value of reliability in providing for it should be equal to unity. If for some reason absolute reliability cannot be provided, its level can be established in accordance with a list of priorities that is worked out by the board-of-experts method by workers of the subunits concerned.

Tables of specified production-reserve norms are calculated by the use of a mathematical model, on the basis of which a value of the norm (H) is established as being dependent upon the level of reliability in providing the reserve (P). The model functions in the following way. For each possible value of the annual specified requirement (Π), which is expressed in shipment-unit norms, a definite level of carryover reserve at the start of the year is prescribed. The year is broken down into several computational intervals. The length of the interval is determined by the period during which shipment should be performed mandatorily--the quarter, the month, and so on. The computational interval is divided into sectors (i), the number of which is equal to the number of shipments ($i = \overline{1, M}$). For each sector (see figure), two parameters are determined: the duration of the enterprise's idle time (Δt_i) and the carryover reserve at the start of the next computational interval (X_i). The duration of an enterprise's idle time is determined as

the difference of the date of shipment and the amount of the carryover reserve, which is expressed in days of average daily consumption, which corresponds to the specific nature of the planned change in consumption.

Basic Parameters of a Model for the Case of Two Shipments Within the Computational Interval.



C is the length of the computational interval, days;
C_1 and C_2 are the lengths of the sectors, days;
T_1 and T_2 are the intervals between shipments, days;
X_o is the carryover reserve at the start of the year, tons;
t_1 and t_2 are the carryover reserves at the start of the sector, days;
X_1 and X_2 are the carryover reserves at the end of the sector, tons;
V_1 and V_2 are the amounts of the shipments, tons;
Δt_1 and Δt_2 are the idle times of the enterprise, days; and
R is the average daily consumption, tons.

The carryover reserve at the start of the next sector (the time interval is in days) is computed as the sum of the carryover reserve and the amount of the shipment, reduced by the amount of total consumption during the preceding sector. The consumption of material resources during the computational interval is assumed to be constant. The date of shipment is designated in accordance with the law established for the distribution of shipment dates. Variants in the amount of shipment are formulated in accordance with the established law of distribution. Each shipment variant has its own probability of execution. In the mathematical model, variants are realized on the basis of the preliminary introduction of baseline information on the amounts of the shipments. Suppose that there are two shipment variants for a certain annual requirement: one shipment during the computational interval in the amount of two shipment-unit norms with the probability W_1, and two shipments in the amount of one shipment-unit norm, each, with a probability of W_2. In order to choose the variant, a random-number generator is used in the interval 0 to 1. If, according to the generator, we obtain a number in the 0 to W_1 interval, then computation of the length of the enterprise's idle time (Δt_i) and the amounts of the carryover reserve (X_1) at the start of the next computational interval will be performed according to the variant of one shipment in the amount of two shipment-unit norms (variant 1). For the case where the generator shows a number in the interval from W_1 to 1, the parameters Δt_i and X_i will be computed in accordance with the two-shipments (variant 2). Each of the indicated variants will correspond to definite values of the parameters Δt_1 and X_i. In summarizing the amounts of enterprise idle time (in days), if it occurs, for all the computational intervals during the year, we get the annual amount of idle time, in accordance with which the value of the reliability of provisioning with materials (P) is determined, which corresponds to the carryover reserve established at the start of the year. The

process is repeated iteratively $j = \overline{\{1, N\}}$ where $N \geq 100$, and in so doing the value of the reliability in providing the reserve is averaged out in accordance with each test, striving for a constant value--the mathematical expectation of the degree of reliability in providing the reserve.

$$A(\Delta t_{ij}) = \frac{\sum_{j=1}^{N} \sum_{i=1}^{M} \Delta t_{ij}}{N}, \quad P = \frac{365 - A(\Delta t_{ij})}{365}, \quad \Delta t_{ij} = \begin{cases} 0, & T_{ij} \leqslant t_{ij} \\ T_{ij} - t_{ij}, & T_{ij} > t_{ij} \end{cases}.$$

The degree of reliability in providing the reserve (P) for the annual requirement, which is determined on the basis of the production-reserve norm, is obtained, that is, the relationship $H = f(\Pi, P)$ is established. A table of specified production-reserve norms for any concrete annual specified requirement, where the number of definite production-reserve norms will correspond to the number of degrees of reliability in providing the reserve, is constructed on the basis of this relationship.

Norms for ministries, agencies and Union republics are computed outside the framework of the model described and are reduced to an aggregating (obtaining average weighted values) of the specified norms as a function of the structure of the products-mix group (or type) of the material required, and the number of subordinate enterprises.

A simulation model constructed on the basis of the proposed method and realized on a VANG-2200 minicomputer enabled preliminary calculations of the level of production-reserve norms to be made for a number of values of the annual specified requirement on the basis of the established laws of distribution of dates and variants of amounts of shipment where there is uniform consumption of production resources. The values computed for these norms were checked, based upon a comparison of the levels of reliability in providing the reserves that were achieved by operation of the simulated model and by the actual process of providing supplies and equipment to Minsel'khozmash [Ministry of Tractor and Agricultural Machine Building] enterprises. Supply and equipment resources were represented by ordinary wire (steel 08F5) at Rossel'mash and cold-rolled merchant steel of three grades (steels 45F60, 40F30 and 40F40) at the Volgograd Tractor Plant. The divergence in reliability in providing the reserve did not exceed 2 percent of the level of the actual data at the indicated enterprises, and it amounts to 1 day to 2 days of average daily consumption of material resources. This testifies practically to a convergence of the results of the computations under the proposed model and of baseline data of the actual process of meeting the enterprises' requirement.

There is no doubt that the results obtained require experimental verification and the methodics developments are in need of perfecting. However, right now, at the stage of estimated computations for a limited number of objects, it can be confirmed that the proposed methodological and methodics approaches have been substantiated, and continuation of work in this area will promote a rise in the precision of setting norms, a closer tie thereof with plan indicators, and timeliness in introducing norms that have been developed into the practical work of ministries and agencies, providing for a solution to most important national-economic tasks of savings and the rational use of materials and equipment resources.

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RESOURCE UTILIZATION AND SUPPLY

GOSPLAN OFFICIAL COMMENTS ON RAW MATERIALS RECYCLING

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[Article by N. Pirogov, deputy chief, Department for the Use of Secondary Resources, USSR Gosplan, candidate of economic sciences: "Two Approaches to Wastes"]

[Text] The past four years have shown that the measures taken by the party and government to recycle more wastes have prompted many ministries, departments and labor collectives to intensify this work. Compared to the beginning of the five-year plan there has been a substantial increase in the use of wood wastes, blast furnace slag, phosphogypsum, broken glass and other resources. However, one must admit that the degree of use is still low. For example, 80,000 tons more of recycled polymer are now used than were used at the beginning of the five-year plan, but this is still only 8 percent of total resources. The recycling of phosphogypsum, ash and slag is only somewhat greater, 10 - 12 percent. These cases indicate that the national economy still has huge unutilized reserves.

Understandably, these cannot be completely used in the five-year plan, it is impossible to build the essential processing capacity in a short period of time. However, with rare exceptions, even the more modest plan targets for the use of the most important production wastes are not met. In four years industry has not recycled more than 40 million tons of secondary materials. This applies just to targets approved by the USSR Council of Ministers. The elimination of this lagging would free primary resources valued at more than a billion rubles.

Why are the growth rates for industrial and household waste processing so slow? There are many reasons, but the main one was cited in the CPSU Central Committee Decree: "On Serious Shortcomings in the Use of Secondary Material Resources in the National Economy": managers at a number of ministries and departments continue to underestimate this factor of production intensification.

How is this underestimation revealed? Understandably, not in words. The speeches at ministry board conferences and meetings sound correct. As the party teaches, let us judge by concrete deeds. Specifically, we will examine the organization of this work in some sector staffs.

In 1980, on the eve of the current five-year plan, the USSR Council of Ministers passed a degree stating that beginning in 1981 USSR ministries' and departments' plans should have a section on "The Use of Secondary Raw Materials" with the appropriate indicators. The USSR Ministry of the Fruit and Vegetable Industry did not comply with this instruction. In 1982 USSR Gosplan and USSR Gossnab approved the assortment of secondary raw materials, targets for the procurement and use of which should be included in plans. A special letter stressed that ministries will independently approve enterprise targets for wider assortments. The Ministry of the Fruit and Vegetable did not comply with this instruction either. The sector staff drew up subdepartmental plans only for items and volumes obtained "from above". Even this was simply formal, without elaboration of the questions.

Thus, the state plan gives the Ministry of the Fruit and Vegetable Industry targets for the production of pectin and fruit powder from apple pomace. These products are needed by the confectionery and canning industries. Last year' targets for powder were only 7 percent fulfilled and those for pectin, 50 percent. Could it be that there was not enough raw material? No, there were sufficient amounts. However, not more than 10 percent of the pomace was allocated for powder and pectin production. The remainder was fed to livestock and some was irretriebably lost.

One can talk about there not being enough production capacity, but, in our view, this would not be about fundamental causes, but about effects. In order to show the sources of this, we will give an other example where it is not at all necessary to build processing enterprises.

Oils extracted from fruit seeds are scarce products in the food and some other sectors. They should be supplied to the food industry by fruit and vegetable industry enterprises. However, last year's target was only 64 percent fulfilled. The shortfalls since the beginning of the five-year plan have built up to one and a half year's output. It would seem that with such a situation use should be made of the slightest possibility of increasing supplies. What is happening instead of this? As it did in past years, the all-union ministry assigned the Georgian SSR Ministry of the Fruit and Vegetable Industry targets equaling 25-30 percent of available resources. The Kazakh and Kirgiz republic ministries were given no targets at all for the collection and delivery of fruit seeds.

We mentioned only two types of wastes, but there are dozens of them. Who in the USSR Ministry of the Fruit and Vegetable Industry coordinates all this work? The responsibility is diluted. The all-union ministry apparatus does not have a service which would work on discovering and using additional sources of raw materials.

While in the Ministry of the Fruit and Vegetable Industry the shortcomings in the use of secondary raw materials can be partially explained by the youth of the ministry itself -- it was set up five years ago -- the situation in the USSR Ministry of Power and Electrification is more difficult to understand and

explain. It also has no "Use of Secondary Raw Materials' section in its plans. Various units are engage in waste utilization, but the ministry management poorly controls their work.

The problem is posed in a different way in the USSR Ministry of Light Industry. Here a central commission for the economical and rational use of material resources was set up in the very first year of the five-year plan. Its leadership was entrusted to A. Yefimov, first deputy minister. Similar services were set up in five subsectors, republic ministries and all-union production associations. Involved in the entire complex of questions concerning economies of raw materials and the introduction of low waste and waste free technologies the commissions, of course, are looking at the recycling of materials. Also, two special departments have been set up at Soyuzglavlegpromsyr'ye [Main Administration for the Delivery of Raw Materials for the Light Industry]. Their task is to precisely plan the use and monitor deliveries of secondary resources.

One can dispute the organizational arrangement for the management of this important work, but one thing is certain: if it is not entrusted to specific individuals there will be many words and not much action.

In Light Industry they were able to pose everything within a single regulation. They accumulated a "wastes bank" -- a list of secondary resources formed in all subsectors. This indicated those which should be recycled at their own enterprises and those to be sent to other sectors. Procedures and norms for the collection and sales of wastes were approved. Instructional material was assembled covering how to collect, sort, store, account for and use secondary resources. All this was within the view of not only the commission, but also the ministry board and its scientific-technical council.

There are undoubtedly benefits from such organization. The sector fulfills state targets for the use of secondary raw materials. High levels of utilization are attained for some wastes. For example, 9 out of 10 kilograms are recycled and 6 of these are reprocessed at the original enterprise. This frees each 14th ton of primary textile raw materials. In the hide industry they recycle four-fifths of the wastes.

There are, of course, shortcomings in the USSR Ministry of Light Industry. These were pointed out to the sector's managers last year at a session of the Interdepartmental Commission on the Economical and Rational Use of Material Resources. Taking this justified criticism into account, the ministry outlined important new measures to increase waste use to 95 - 96 percent.

I think that these examples are worthy of reflection. The main thing now is to overcome lagging and to complete everything intended by the plan and mentioned at the CPSU Central Committee meeting with managers, brigades, specialists and scientists. There can be no delays with this. In order to reach the end of the year and the five-year plan unburdened by shortfalls, sector staffs must objectively examine the secondary resource use situation at their associations and enterprises and render specific assistance in the reducing and using wastes.

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RESOURCE UTILIZATION AND SUPPLY

CONSERVATION OF MATERIALS, FUEL IN INDUSTRY SOUGHT

Material-Intensiveness and Intensification

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[Text] The October (1984) Plenum of the CPSU Central Committee emphasized: "We must achieve a dramatic breakthrough in increasing the national economy's efficiency already under the 12th Five-Year Plan."[1] The successful fulfillment of plans for the nation's economic and social development depends above all on increasing the effectiveness of production and on the fastest possible conversion of all branches of the national economy to the path of intensive development.

The rational use of material resources is a most important component of the intensification of production. The lowering of the material-intensiveness of production saves capital investments in the extractive branches and in procurement; reduces expenditures of labor, fuel and energy in the manufacturing branches and in transport; improves the utilization of nonreproducible natural resources; and preserves optimal ecological conditions for society's life activity. The same volume of labor resources and capital investments create prerequisites for the accelerated growth of the volume of national income and the final product of branches of the national economy.

The dynamics of the material-intensiveness of production should also be taken into account in the analysis of differences in the growth rates of produced and utilized national income. In addition to factors associated with the balance of foreign economic operations and losses, the more rapid growth of produced national income compared with utilized national income is also influenced by the tendency of the material-intensiveness of the social product to diminish in comparable prices. Produced national income, calculated as the difference between the value of the social product and material costs, grows in proportion to the increase in the volume of production and the lowering of the material-output ratio. As a result, conditions are established for increasing the consumption and accumulation funds that comprise utilized national income, but there is no corresponding increase in the latter in the

given year. For example, if the material-output ratio declines in industry group 'B'and the physical mass of consumer goods does not grow in the process, the consumption fund will not grow and produced national income, to the contrary, will increase by the sum of the economy of these material resources.

The lowering of the material-output ratio will thus be an additional factor in the relatively more rapid growth rate of produced compared with utilized national income, a point that must be taken into account in plan calculations of basic indicators of development of the national economy.

The saving of current material costs in the production process is closely associated with the increase in material working capital in the accumulation fund. The more completely and effectively material resources are used, the fewer of them will be required to form the replacement fund and the more of them can be used to balance the growth of productive fixed capital and the objects of labor to be processed. The effective application of objects of labor in material production also creates conditions for increasing the consumption of material resources in the nonproductive sphere and in the process promotes the growth of the share of the consumption fund in utilized national income.

The conservation of material resources is directly influenced by the (1981) decree of the CPSU Central Committee and the USSR Council of Ministers "On the Intensification of the Effort to Conserve and Make Rational Use of Raw Material, Fuel-Energy and Other Material Resources" in accordance with which the indicator of expenditures of raw materials and supplies per ruble of output becomes a planned indicator. In addition to the existing system of norms, plan indicators of the material-output ratio orient all economic links toward the intensification of production and the conservation of material resources. The interrelationship between the conservation of materials and the rising technical level of production is strengthened in the process. The improvement of product quality and the simultaneous lowering of the consumption of material resources are possible only if the production apparatus is renovated on a new scientific-technological basis. The more complete processing of material resources and the relatively more rapid improvement of product quality compared with the increase in its physical volume are becoming the condition to the intensification of production.

On the whole, the size of the replacement fund in the utilized social product is predetermined by the existing scale of production, by normative material costs of producing the final product and by the materialization of scientific-technical progress in new resource-saving technologies and objects of labor. The dynamics of the material-output ratio depends primarily on the correlation of the rate and scale of diffusion of material-saving technologies in all branches of the national economy and he increase in costs in the extractive branches. The material-intensiveness of the social product in 1975-82 as the ratio of material costs to gross output in actual prices is reflected in Table 1.

The material-intensiveness of the social product was seen to decline in 1975-1981. The production of a ruble's worth of social product in 1981 required 1.2 kopecks of material expenditures less than in 1975. If material-

intensiveness in 1981 remained at the 1975 level, it would have cost an additional 14 billion rubles to produce the social product.

Table 1. (kopecks per ruble)

	1975	1980	1981	1982
National economy as a whole	57.9	57.1	56.7	57.7
Industry	65.8	65.3	65.0	66.3
Agriculture	49.7	54.8	54.3	52.8
Transport and communications	37.3	43.2	43.6	42.8
Construction	55.0	54.0	53.9	54.9
Trade, procurement, material-technical supply, etc.	13.6	9.8	9.3	9.6

The increase in the material-output ratio in 1982 was occasioned by the introduction of the new wholesale prices. Prices rose at a relatively more rapid rate in the extractive, material-producing branches and hence the level of material-intensiveness rose throughout the national economy as a whole. The price factor influenced the increase in material-intensiveness in industry and construction in 1982 compared with 1981, while in agriculture the increase in purchase prices led to the lowering of the material-intensiveness indicator.

Among the various branches of the national economy, the material-intensiveness of industry alone surpasses the national economic level of that indicator. Therefore the increase in the share of industry in the structure of the social product leads to the growth of national economic material-intensiveness. Growth of the share of other branches of the national economy in the social product, on the other hand, leads to the lowering of the material-intensiveness of the latter.

Calculation of the material-intensiveness of the social product in comparable prices reveals the following changes in the indicator (kopecks per ruble): 1975 -- 57.9; 1980 -- 57.5; 1981 -- 57.5; and 1982 -- 57.2.

There is an noticeable trend toward the lowering of material-intensiveness of the social product. In 1982, its level in comparable prices declined by 0.3 points compared with 1981. As noted, this indicator increased in actual prices in 1982. Thus, while the expenditure of material resources per ruble's worth of social product decreased in physical terms but increased in value terms. Consequently, as a result of the 1982 price reform, the share of produced national income in the social product declined in terms of value while increasing in physical volume.

A similar situation was also seen in the 1967 price reform. Higher costs in the extractive branches led to higher prices on their products. Moreover, the lowering of material-intensiveness in the manufacturing branches in the intervening time between price reforms was in a sense offset by the rise in the share of material costs in the social product as a result of rising prices in the extractive branches. For example, the material-intensiveness of the social product declined by 1.2 points between 1975 and 1981 and as a result of the introduction of new prices in 1982, its level once again approached the 1975 level (Table 1).

Under these conditions, change in the level of material-intensiveness is also conditional upon the scale of introduction of resource-saving technology and the degree to which the rational use of material resources under the influence of scientific-technical progress offsets higher costs in the extractive branches. An increase in material-intensiveness in the price reform process compared with the base level (for example, the level that existed 10 years ago) means that the influence of resource-saving factors of scientific-technical progress was insufficient during that period. And conversely, when there was a stable downward trend in material-intensiveness during that decade and when the regularly scheduled price reform did not raise the level of material-intensiveness compared with the level of the previous decade, the rise in current costs in the extractive branches was neutralized by the improved use of material resources.

The dynamics of material-intensiveness in comparable prices shows that there was an increase in the effectiveness of productive consumption of material resources in the national economy in 1975-82. The system of norms and the planning of the material-output ratio have a substantial influence on promoting the rational consumption of objects of labor. This process is most dynamic in industry. Thus in 1982, the share of material costs (without amortization) in the total volume of industrial output was 62.7 compared with 65.2 in 1975. This indicator declined in such branches of industry as the chemical, petrochemical, machine building, glassmaking, porcelain-faience and light industry, while material costs per ruble of output increased in other branches of material production. Therefore the normative method of planning the saving of material resources must undergo further development in the elaboration of plan targets and in the oversight over their fulfillment.

The dynamics of the materials-output ratio attests to change in the level of material costs per unit of output, but does not indicate either the size of the saving or the overexpenditure of material resources in branches of the national economy and industry compared with other types of resources.

Therefore in evaluating the material-output ratio from the standpoint of the increase in the effectiveness of social production, it is necessary to take the scale of turnover of material resources in the national economy into account. It is immeasurably higher than the turnover rate of fixed capital and the volume of capital investments.

Material costs in the social product in 1982 totaled 57.7 percent and national income was accordingly 42.3 percent (Table 2). If produced national income (minus the balance of foreign economic exchange and losses) is considered to be equal to utilized national income and if one examines the physical

structure of the latter, it can be considered that material resources are the physical basis of newly created value. They are present in the consumption fund (expenditure of material resources by branches of the nonproductive sphere) and in the accumulation fund (growth of material working capital and, in part, reserves). Thus, material costs in the physical structure of the social product have an even higher share than shown in Table 2.

Table 2 (in billions of rubles)

	Gross output	Net output	Material costs	Share of material costs in gross output (%)
National economy	1236.0	523.4	712.6	57.7
Of which:				
industry	792.7	266.8	525.9	66.3
agriculture	170.3	80.3	90.0	52.8
transport & communications	55.2	31.6	23.6	42.8
construction	115.1	51.9	63.2	54.9
trade, procurement, material-technical supply, etc	102.7	92.8	9.9	9.6

The share of turnover of productive fixed capital, calculated as the sum of the growth and replacement of retired capital, in the 1982 social product was 11.3 percent. This indicator was 7.4 percent in industry, 25.8 percent in agriculture and 9.6 percent in construction.

In absolute terms, material costs in 1982 totaled 712.6 billion rubles, while the sum of the growth and replacement of retired (activated) fixed capital was 139.5 billion rubles. Thus a saving of one percent in material costs in value terms in 1982 was the equivalent of a saving of 7.1 billion rubles and a corresponding saving of one percent in productive fixed capital as a result of the lowering of the sum of their growth and retirement was the equivalent of a saving of 1.4 billion rubles.

When the reproduction of the social product is entirely intensive, the material- and capital-intensiveness of national income is lowered. When the increase in capital per worker in some branches is associated with the raising of the technical level of production and with the introduction of material-saving technology, the lowering of the output-capital ratio may be accompanied by the lowering of the material-output ratio.

An important condition to the rational utilization of material resources is the balanced growth of the implements and objects of labor. Productive fixed capital, like all physical products of human labor, is produced from objects

of labor. The faster the production potential grows, the more material resources are expended on these needs. When production capacities are effectively utilized (taking the reserve into account), i. e., when there is a balanced increase in productive fixed capital and objects of labor are appropriately processed, the relatively more rapid expenditure of material resources on the creation of an increasing number of implements of labor is economically feasible. But if production capacities grow without a corresponding increase in the volume of raw materials, supplies and semimanufactures, which ultimately leads to the underutilization of existing production apparatus, the expenditure of material resources on increasing productive fixed capital will be redundant.

The dynamics of the indicator of technological productivity of productive fixed capital, which is determined as the ratio of material costs (without amortization) to the value of productive fixed capital and characterizes the balance correlation between the means and objects of labor. For specific types of production, its normative values can be determined on the basis of materials developed by project-planning institutes on the expansion, reconstruction and technical retooling of existing enterprises and the construction of new enterprises.

Increases in output-capital ratio, technological productivity of productive fixed capital and output-materials ratio are interconnected by the following functional dependence

$$G_{oc} = G_{fc} + G_{om}$$

where G_{oc} is the growth rate of the output-capital ratio, determined as the ratio of national income to productive fixed capital; G_{fc} is the growth rate of the technological productivity of productive fixed capital; and G_{om} is the growth rate of the output-materials ratio calculated as the ratio of national income to material costs (without amortization).

The output-capital ratio can thus increase with the growth of the technological productivity of capital and with the increase in the output-materials ratio (the lowering of the material-output ratio).

Table 3 (in comparable prices)

	1975	1980	1981	1982
Output-capital ratio (kopecks/ruble)	45.1	39.1	37.8	36.9
Growth rate (%):				
vis-a-vis 1975	--	-15.3	-19.3	-22.2
for periods	--	-15.3	-3.4	-2.4
Technological productivity (kop./ruble)	55.8	46.8	44.9	42.9
Growth rate (%)				
vis-a-vis 1975	--	-19.2	-24.3	-30.0
for periods	--	-19.2	-4.2	-4.7
Output-materials ratio (kop./ruble)	80.8	83.8	84.2	85.9
Growth rate (%):				
vis-a-vis 1975	--	3.7	4.2	6.3

for periods.....	--	3.7	0.5	2.0

The increase in the output-materials ratio in 1975-82 (Table 3) had a stabilizing influence on the dynamics of the output-capital ratio. If the material-output ratio in national income were stable, the output-capital ratio would decline at the same rate as the technological productivity of productive fixed capital. The reduction of the volume of material costs per ruble of productive fixed capital by 30 percent between 1975 and 1982 attests to the fact that during that period the national economy established additional production capacities that were not accompanied by an increase in material resources to to be processed.

The draft plan of economic and social development under the 12th and subsequent five-year plans must take into account the existing discrepancy between the implements and objects of labor and must eliminate this discrepancy by means of an appropriate investment policy since the indicator of technological productivity of productive fixed capital is rapidly declining in the manufacturing branches of industry as well. In the process of planning production, it appears advisable to calculate the normative volume of material expenditures necessary for the production of the planned volume of specific products using specific equipment. Normative annual volume of materials processing by the principal types of fixed capital or technological complexes can be determined on the basis of coefficients of expenditure of raw materials and supplies on production and the calculated productivity of the equipment that is used.

The resulting indicators of technological productivity (processing capacity) of fixed capital can be regarded as planned normative parameters of the balance of the means and objects of labor.

The technological productivity of capital must increase in proportion to the increased productivity of equipment and improvements in the technology for processing raw materials and supplies, to the more economical use of fuel and energy, and the processing of waste and secondary resources.

The material-output ratio holds special significance for the development of the Russian Federation's economy. The formation of replacement and accumulation funds in the country's social product is to an ever greater degree predetermined by indicators of economic and social development of the RSFSR.

The share of industry, including machine building, in the social product of the RSFSR is higher than in other union republics. Therefore the effectiveness of processing of material resources will depend to a considerable degree on their correct combination in the development of the extractive and manufacturing branches. Distinctions between their growth rates in RSFSR industry are diminishing. While the growth of the manufacturing industry was 1.21 times greater than the growth of the extractive industry in 1977-70, in 1971-75 it was 1.15 times greater; and under the 10th Five-Year Plan -- only 1.11 times greater. The same trend is also observed under the 11th Five-Year Plan.

The extractive branches of the RSFSR are to an ever increasing extent satisfying the needs of other union republics and are also exporting minerals, raw materials, fuels and energy resources. The expanding volume of production in materials-producing branches is relatively more rapid than the comprehensive processing of material resources and the comprehensive utilization of natural raw materials.

The share of RSFSR in all-union natural resources is substantially higher than its share in national income and the nation's social product. Nonetheless the resource-intensiveness of national income is declining slowly.

This is accompanied by the higher cost of extracting principal types of natural resources as a result of the movement of extraction centers to relatively undeveloped regions of Siberia and the Far East, higher wage costs and higher costs of production, social and service infrastructures. This ultimately has a negative impact on the dynamics of the materials-output ratio in the RSFSR, even though this trend can be considered positive from the all-union standpoint.

The most important problem in the European part of the RSFSR is to conserve material and especially fuel-energy resources. This problem is the result of spatial disparities in the concentration of the republic's productive forces. The European part of the RSFSR (including the Urals), while occupying 20 percent of the republic's area, concentrates 80 percent of the population and a large part of the RSFSR'S fixed capital. At the same time, the production needs of the republic's European part for fuel, energy and timber are satisfied by imports from other regions. Most of the natural resources that are the basis of the long-range development of the country's economic complex are located in Siberia and the Far East. The correlation of the natural resource potential and the volume of production is the direct opposite for these two regions of the RSFSR.

The development of Siberia and the Far East is a long-range process. Accordingly, the development of the Russian Federation's productive forces in the foreseeable future will entail increasing deliveries of fuel, energy, mineral and raw material resources from East to West.

The successful resolution of this problem depends on the development of such an investment- and materials-intensive branch as transport. A considerable percent of the oil refinery products and electric power produced in the republic is consumed by common carrier shipping. The share of higher shipping costs in the cost of transported products is mounting. Shipping costs account for more than one-third of the cost of products in many branches of the extractive industry. Therefore the material-intensiveness of the social product of the RSFSR is predetermined to a greater degree than in other union republics by the volume and effectiveness of the use of material resources in transport.

The higher investment-intensiveness of the increased output of the extractive branches leads to the relatively more rapid growth of capital per worker in this complex compared with industry in general. The rise in capital per worker coupled with the accelerated decline of the output-capital ratio in the extractive branches causes a slowdown in the growth of labor productivity both in the republic and in the nation as a whole.

Therefore priority in the structure of capital investment should be given not so much to increasing the volume of production of raw materials, fuel and supplies as to improving their quality and expanding their mix as a result of a their deeper processing.

For example, evaluation of fuel and energy conservation measures shows that they require from one-third to one-half less capital investment than the amount required to increase the production of reference fuel by one ton. In view of the higher investment required to increase fuel production, fuel conservation measures become more and more effective. What is more, the conservation of energy resources in most cases involves the replacement of one kind of equipment by another and does not require additional labor resources. Consequently, only an active material-saving policy in all branches of the national economic complex can neutralize the negative impact of the objective deterioration of the conditions of development of the extractive branches (first of all, the fuel-energy complex) on the rates and proportions of economic and social development of the republic and the nation as a whole.

The deeper processing of raw materials and supplies, the broad application of secondary resources, and the total utilization of valuable components of mineral and fuel raw materials and the spent rock and waste of concentrating mills, thermal electric power plants, metallurgical and chemical plants, and promote the optimal use of material resources and the technological productivity of fixed capital.

At the present time, the degree of utilization of the physical mass of iron ore, copper ore, bauxite, and potassium salts is considerably lower than the content of these minerals in the ore. Specialists estimate that if useful components were completely extracted, ore could be produced at a slower rate in the mining industry.

Among the most important reasons behind the incomplete utilization of natural raw materialsare the departmental separateness of mining and concentration combines and the practice of basing physical plan indicators of the extraction of raw materials on the specific branch to which enterprises belong rather than on the degree of completeness of the utilization of nonreproducible natural resources. We believe that net income should be the principal indicator used to evaluate the performance of mining enterprises and that the majority of them should be subordinate to territorial rather than branch organs of management.

The share of secondary raw materials among raw material resources will grow in proportion to the increasing scale of production and the accelerated renovation of fixed capital. In developed capitalist countries, the share of waste paper in the production of paper and cardboard is as high as 50 percent; approximately 60-70 percent of the copper requirement is met by copper wire rather than by extraction from copper waste. There is obviously an urgent need to strengthen the material-technological foundation of bases responsible for the collection and initial processing of secondary resources and possibly to establish a multispecialty branch of secondary resources within the USSR Gossnab [State Committee for Material and Technical Supply] system.

These factors will have a positive impact on the output-capital ratio by virtue of the fact that the capital-intensiveness of additional output resulting from deeper processing and the more complete utilization of raw materials is substantially lower than the capital-intensiveness of the growth of output in the extractive industry. For example, the capital-intensiveness of oil extraction is roughly four times higher and the capital-intensiveness of iron ore and mined chemical raw materials is two times higher than the capital-intensiveness of their refining.

Analysis of proposals by ministries and departments on the long-range development of corresponding branches of the national economy and industry shows that some of them do not devote sufficient attention to the intensive processing of natural raw materials.

Thus the following coefficients of relatively more rapid growth compared with the growth of timber procurement formed in the timber, wood processing and pulp-paper industry in 1971-85: pulp -- 1.81; paper -- 1.54; cardboard -- 1.69. The pulp-paper industry not only does not plan to raise these coefficients in the interest of the more intensive processing of timber and the maximum circulation of secondary raw materials, but to the contrary, is planning to lower them. The relatively more rapid production of splint-slab and wood fiber blocks compared with timber procurement is diminishing.

We believe that the 12th Five-Year Plan for the development of the national economy should be formulated such that the increase in the volume of the final product would substantially exceed the production of the most important types of material resources from which this final product is produced. This means primarily the final product for interbranch, national economic rather than intrabranch circulation. The implementation of such measures will have a favorable impact on the material-output and capital-output ratios in the social product in the RSFSR and the nation as a whole.

The integrated utilization of natural raw materials also presupposes the integration and closer territorial proximity of technologically interconnected extractive and manufacturing facilities. This requires the restructuring of the management of territorial production complexes in the direction of strengthening territorial planning organs responsible for the comprehensive and effective development of production in a given area.

The lowering of the materials-output ratio and the accelerated production of the final product for the more complete satisfaction of social needs compared with the intermediate product that is expended on intrabranch consumption makes new demands on the combination of integration and specialization of the economy of union republics. They consist in the fact that the "degree of openness" of the republic's economy, which is calculated as the ratio of the sum of imports and exports to the social product (or national income) produced in the republic must be raised on the basis of the national economic final product with a higher degree of readiness to be consumed and must be diminished, correspondingly, as a result of the reduced imports and exports of the intermediate product with a low level of readiness to be consumed.

The improved manufacture of products of republic specialization up to and including the final product within the framework of the all-union specialization of production creates more equally profitable conditions for commodity exchange between republics, corresponds to the strategic direction of the country's economic and social direction in general, and promotes the integrated utilization of natural resources and the growth of exports of the manufacturing branches.

A necessary condition to the reduction of the materials-output ratio is the more precise orientation of scientific-technical progress toward the broad introduction of material-conserving equipment and technology. It is presently not sufficiently oriented toward the saving of embodied labor. So it was that between 1976 and 1980, new technology measures accounted for 50.5 percent of the increase in national income per worker (including measures promoting the growth of productivity of live labor -- 40.7 percent) and only 9.8 percent was the result of the implementation of measures to economize embodied labor.

The number of new types of machinery, equipment, apparatus, and instruments created in such subbranches of machine building as the production of casting equipment, equipment for the fuel industry, and construction is substantially lower than in other subbranches of industry.

At the present time, advances in science and technology are introduced first in the manufacturing rather than the extractive branches. The quality of objects of labor, the degree of their readiness for subsequent processing (for example, the correspondence of the quality and structure of metal products to the needs of machine building) predetermine the reliability and service life of implements of labor and hence the cost of renovation, routine and capital repairs of fixed capital.

Multioperational technology which requires the development of machinery with large unit capacity must give way to technology involving a small number of operations and a smaller number of stages in the processing of natural raw materials until the final product is produced. In our opinion, the integrated 20-year program of scientific-technical progress, instead of forcing the development of the extractive branches, should devote more attention to reducing the materials-output ratio, to raising the technological productivity of productive fixed capital, to increasing the effectiveness of introduction of materials- and energy-saving technologies in all branches of the national economy.

Norms governing the consumption of nonreproducible natural materials both in volume and in time are given by nature itself. Hence the demands that are made on scientific-technical progress with regard to economizing objects of labor and replacing them by manmade objects. In a certain sense, the materials-output ratio is a derivative of the level of scientific-technical decisions, the degree of efficiency of designs of new types of products, and the technico-economic level of production. The more sophisticated the designs and technologies that are based on advances in basic and applied science from the standpoint of conserving material resources and creating fundamentally new materials-conserving technology, the more favorable will the dynamics of

the materials-output ratio and production costs be. In the long run, it is specifically the solution of this problem that determines the effectiveness of social production.

FOOTNOTE

1. "Materialy Plenuma Tsentral'nogo Komiteta KPSS, 23 oktyabrya 1984 g. [Materials of the 23 October 1984 Plenum of the CPSU Central Committee], Moscow, Politizdat, 1984, p. 12.

Material-Intensiveness and Technological Progress

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[Article by Professor Yu. Yakovets, doctor of economic sciences]

[Text] The 26th CPSU Congress defined the more effective utilization of natural, material and labor resources as one of the most important strategic tasks of the eighties. This is the most effective way of multiplying the nation's wealth, of raising the level of the Soviet people's well-being in a brief period of time. Resource conservation becomes a most important source of economic growth under the conditions of intensification of production.

Intensive targets for the conservation of raw materials, supplies, fuel, and energy and for utilizing secondary raw materials in production have been set for the current five-year plan. As a result of the lowering of the material-intensiveness of the social product, a total 10.6 billion rubles' worth of material stocks were conserved during the first 3 years of the five-year plan alone. The energy-intensiveness of national income declined by almost five percent; metal-intensiveness -- by more than six percent.

Ministries and departments and every association, enterprise and construction project have developed and are implementing specific resource-conserving measures. Proper procedures are being instituted for the norming, accounting and storage of resources and stronger material and moral incentives are offered to encourage conservation as a factor in lowering production costs above and beyond the plan. Nonetheless, the largest reserve for reducing the material-intensiveness of the social product is long-term measures to utilize long-term measures to utilize the highest attainments of the scientific and technological revolution and to improve the structure of the economy.

The declining growth rate of production of material resources is primarily due to the deterioration of the natural conditions of extraction of raw materials and fuels and the considerable increase in their cost. Nor is a substantial increase in material resources to be expected in the future. And indeed it is not necessary since the stage of predominantly extensive development of the Soviet economy is already past.

The principal reserve for satisfying the need for material resources lies not in producing more of them, but rather in using them more effectively. The 26th CPSU Congress noted that compared with the best world indicators, we expend more raw materials and energy per unit of national income and that we have the possibility of significantly increasing production of the final product from existing resources.

The effectiveness of utilization of raw materials and supplies can be raised dramatically and the world's best indicators of expenditure of raw materials and supplies per unit of final product can be approximated only on the basis of the mass introduction of resource-saving equipment and technology and the planned utilization of the highest attainments of the scientific and technological revolution. The introduction of microprocessor technology, low-waste and waste-free production processes, powder metallurgy, and part-rolling mills is sharply reducing the requirement for energy resources and materials.

New models of motor vehicles that significantly reduce fuel expenditures per hundred kilometers and new types of transport and communications (pneumatic transport and fiber optics, for example) are being developed. New, more economical household appliances are being developed on the basis of advances in radioelectronics. Thus microwave ovens reduce the amount of energy required for food preparation several fold while at the same time preserving nutrient values. The use of microprocessors in new-generation television sets, refrigerators and washing machines makes it possible to curb the expenditure of energy in the home.

Consequently, the planned utilization of the highest attainments of science and technology is a decisive factor in substantially lowering the material-intensiveness of social production. This is the objective of the uniform scientific-technical policy, the basic content of which is articulated in the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures for Accelerating Scientific-Technical Progress in the National Economy."

More favorable prerequisites for the accelerated introduction of resource-conserving equipment and technology are created in branches operating under the terms of a large-scale economic experiment. Thus, starting with the present year the five-year plans of machine building ministries converted to the experiment include mandatory targets for developing, introducing and expanding the use of new machinery and production processes; limits on spending per ruble of commodity output; and targets for the average reduction of the basic types of material resources, fuel and energy per million rubles of commodity output and norms governing their expenditure.

With the aim of increasing the economic incentive of production associations (enterprises), starting with the current year an annual reduction of material costs by at least 1.5 percent will be instituted in the Ministry of the Electrical Equipment Industry, the Ministry of Instrument Making, Automation Equipment, and Control Systems, the Ministry of Chemical Machine Building, and the Ministry of Power Machine Building. The planned sum of payments to the fund for sociocultural measures and housing construction will be increased by 10 percent (but not more than 50 percent of the saving). Production associations and enterprises belonging to the USSR Ministry of Ferrous

Metallurgy have instituted an indicator of metal saved in the national economy by the production of economical types of metal products.

Production associations (enterprises) are given broader opportunity to use part of the unified fund for the development of science and technology, the production development fund, capital repair deductions and bank loans for the development of new technology and for the technical retooling of production. This increases the motivation and responsibility of the basic cost accounting link for conserving material resources, fuel and energy and for using advances of science and technology to that end. The diffusion of cost accounting teams serves the same goal. By the end of 1983, they numbered 218,000 in industry and more than 93,000 in construction.

What are the reserves for economizing material resources on the basis of scientific-technical progress with regard to sequential technological stages of their reproduction and utilization: extraction, processing, shipping, storage, and consumption?

In the stage of extraction of mineral and timber raw materials, the principal task is to develop and introduce machinery and technology to ensure the more complete extraction and total utilization of mineral wealth and timber resources. The existing extraction technology leaves a considerable part of the oil, potassium salts, coal, ferrous and nonferrous metal ores, and other minerals in the ground. Calculations show that the raising of the oil recovery factor by just one percent and the reduction of losses can result in the production of several million tons of additional oil.

Most of the striprock resulting from the extraction of raw materials is deposited in waste heaps even though it contains valuable minerals needed by the construction industry. Technical means are required for the total processing of all ore extracted from the earth. Mountains of halite waste have formed in the vicinity of potassium salt mines even though effective technology has been developed for producing scarce salt from halite. Systems of machines for the procurement and transportation of timber raw materials (including branches, stumps, roots, and leaves) and for tree farming are as yet being developed at a slow pace.

The development of geotechnology, the essence of which consists in the extraction of minerals by fundamentally new, subsurface methods without human participation (for example, the underground smelting of sulfur, the leaching of certain useful components, etc.). The search is made for ways of using biogeotechnology -- the extraction of certain useful components with the use of bacteria. Thermal techniques and surface-active agents are being used to raise the oil recovery factor.

The development and introduction of resource-saving technology in the extractive industry are being promoted by plan targets for increasing the degree of extraction of major types of raw materials from the ground, for utilizing striprock and enclosing rock and by a system of fines in the mining industry for above-norm losses of solid minerals and by-product gas. However, the economic incentives for the more complete extraction of useful components

and for recycling waste are insufficient. The rational use of natural resources must play a leading part in the system of planning and evaluation indicators used in the formation of economic incentive and bonus funds for workers in the extractive industry. This will offer greater motivation for the development and utilization of nature-saving technology. In the evaluation of the effectiveness of new technology, more consideration must be given to the ecological factor -- to its impact on the conservation of natural resources and on reducing environmental pollution.

The economic experiment motivates labor collectives to utilize mineral raw materials to the fullest. Thus the Magnitogorsk Metallurgical Combine imeni V. I. Lenin and the Sililovsko-Sarbayskiy Concentration Combine are authorized to pay into their economic incentive funds an additional 50 percent of the profit resulting from the sale of by-product components, from the integrated use of mineral raw materials and concentration waste, and from the reduction of losses. Consequently this procedure would also be extended to other enterprises and production associations.

In the enrichment and processing of mineral, timber and agricultural raw material, the main problem is the total extraction of all useful components and the widespread introduction of waste-free and low-waste technologies. There are numerous examples of the successful solution of this problem. In its day the experience of increasing the quantity of useful components extracted from the ores of nonferrous metals in the Ust'-Kamenogorsk Combine and the Balkhash Mining and Metallurgical Combine was approved. The Glinozem Production Association is successfully using a wastefree technology in the integrated processing of nepheline concentrates making it possible to produce inexpensive alumina, cement, potash, and soda-potash mixtures.

However in a number of branches the losses of natural raw materials during processing are still high for a number of reasons. Under the existing branch structure of management, ministries and associations ordering the design of mining and concentration enterprises are primarily interested in the extraction of the components that are their principal responsibility; everything else is consigned to the waste heap. A classic example is the primary orientation toward the production of apatite concentrate in the Khibiny nepheline-apatite ore fields. In the process, much nepheline, aegirite, sphene, rare earth, and other valuable components are lost even though their extraction is technologically possible and economically feasible. Tens of millions of tons of striprock, enclosing rock and concentration waste have accumulated at mining enterprises. At the same time, more and more new plots of land are set aside as quarries from which construction materials are extracted.

To remedy the situation, it is planned to compile a long-range all-union input-output table of extraction and consumption of mineral raw materials for the production of construction materials. The development of minerals, striprock, enclosing rock, waste resulting from the processing of mineral raw materials, and ash at thermal electric power plants is planned as the primary raw materials base for increasing the production of these materials.

Wood processing still does little to produce useful products from waste, a considerable percentage of which is burned. We must begin planning and designing mine industry and timber complexes responsible for the extraction of all useful components and for recycling waste material. Capital investments must be allocated for this specific purpose. We must step up the fight against departmentalism which hinders the effective use of material resources. We must accelerate the organization of series production of systems of machines for the comprehensive processing of natural raw materials. Higher prices and rates are now charged for materials, fuel and energy expended in excess of the norms (limits). This measure is applied for the overexpenditure of gas, water and certain other material resources. This procedure should also be extended to the primary stages of processing of natural raw materials. thereby motivating production associations, enterprises, scientific research, project-planning and design organizations to develop waste-free and low-waste technologies ensuring the total processing of raw materials, the extraction and utilization of their useful components and production waste.

There are considerable reserves for conserving material resources in the process of their shipment and storage. Some of the consumer properties of freight are lost in the transportation process. Losses are especially heavy in the shipment and storage of perishable foods (vegetables, fruit, potatoes), agricultural raw materials (sugar beets, for example), mineral fertilizers, and coal. Hence there is a need for technical devices that would reduce these losses to a minimum.

The Food Program provides for the development and introduction of new technologies for the storage of agricultural products with the use of active ventilation, refrigeration and a regulated gaseous atmosphere. More railroad refrigerator and isothermal cars and special trucks for hauling granulated sugar, liquid sugar, live fish, and other foods should be built. Series production of specialized means for transporting friable and liquid fertilizers is presently in progress.

Losses of material resources could be curbed by reducing normative losses on the basis of the increased technical potential for maintaining the integrity of freight, by increasing average transport speed, by reducing the time the freight is in transit and by cutting transshipment time. In our view, transport organizations should bear a greater measure of responsibility for above-norm losses of transported freight and for the deterioration of their consumer properties.

A major additional source of material working capital lies in reducing its reserves to an optimal level in production and in the circulation sphere. The relatively more rapid growth of inventory compared with the growth of production is seen in the majority of branches in the national economy. This leads to the immobilization of a significant part of the material resources and to the creation of an artificial shortage of these resources. The share of reserves in incomplete production, particularly in construction, has risen sharply.

Organs of USSR Gossnab [State Committee for Material and Technical Supply] can exert no little influence on the conservation of material resources. The high rate of inventory buildup is in large measure associated with the

unreliability of deliveries, the relaxation of contractual discipline, the worsening performance of rail transport, and high transit norms in the shipment of certain types of freight (for example, a customer needs several hundred kilograms of material, but the least he can order is a carload or several tons. The inventory in supply and sales organs has grown significantly.

In our view, the economic responsibility of supply and sales organizations for the conservation of material resources should be raised and the technical retooling of enterprises engaged in supply activity on behalf of USSR Gossnab should be accelerated so that they would be able to select and prepare products for consumption with due regard to the specific needs of small customers.

The proper organization of supply is important to the acceleration of scientific-technical progress. The activity of research, experimental and design organizations has its own unique features. Thus, the volume of materials, instruments, and equipment ordered for the development of new technology is usually small, but the demands on mix, quality and delivery schedules are very strict and the needs for material resources change frequently. In our opinion, priority should be given to orders in this sphere and specialized supply organizations and modern instrument and equipment rental points should be set up in scientific centers. There is also a need for sufficient contingency reserves to cover short-term needs that arise in the course of research and development activity and to create prototypes. Paperwork associated with the fulfillment of integrated scientific-technical target programs should be substantially simplified.

There are major conservation reserves in the material resources consumption sphere. It is specifically here that the introduction of resource-saving equipment and technology can yield the greatest return. The saving of rolled ferrous metals, cement, etc., can be considerably increased only by accelerating the rate and increasing the effectiveness of scientific-technical progress. We should try to reduce the expenditure of raw materials and energy per unit of final product through the widespread use of powder metallurgy, laser technology, part-rolling mills, lightweight structural elements, etc. The effectiveness of new technical solutions can be judged according to the following example. The use of wear-resistant and thermally stable coatings will make it possible to save 40-50 tons of metal for every ton of powder metal used and to increase the service life of machines and machine assemblies several fold.

Plan targets for lowering the average norms governing the expenditure of the most important types of fuel, energy and raw materials and the payment of bonuses to workers, foremen, technologists, and other engineering-technical personnel from the actual saving are of no little importance in the development of economic conditions for the accelerated introduction of energy- and material-saving technology. Thus the maximum bonus that can be paid to workers and engineering-technical personnel for saving gasoline and electric power is 75 percent of the saving; for saving diesel fuel used by high-speed engines in transport -- 60 percent; and up to 50 percent of the saving of ferrous metals.

Rational individual consumption is a very important factor in the conservation of material resources. The June (1983) Plenum of the CPSU Central Committee pointed to the need to encourage rational consumption. The fight against philistine tastes and extravagance is being intensified. More economical types of household appliances (previously referred to) are being developed. The development of an integrated target program for increasing the production of consumer goods and services must be accompanied by the accelerated development and mass production of such appliances.

A factor of increasing importance in the conservation of material resources is their recycling, the gradual conversion of the raw materials and fuel-energy base to the utilization of secondary resources forming in the production and personal consumption spheres. Approximately 50 million tons of steel are produced each year from secondary metallurgical raw materials. In order to produce such a quantity of metal from primary raw materials, it would be necessary to mine 190 million tons of iron ore and 75 million tons of coking coal.

The decree of the CPSU Central Committee "On Serious Shortcomings in the Utilization of Secondary Material Resources in the National Economy" demands the accelerated development of capacities for processing secondary raw materials and the reconstruction and modernization of production based on the introduction of low-waste and waste-free technology, the use of by-products and production waste. Ministries and departments must bear full responsibility for the total processing of raw materials and supplies and for increasing the yield of the final product from them.

Progressive enterprises have amassed the experience of utilizing secondary resources effectively on the basis of new machinery and technology. The experience of the Magnitogorsk Metallurgical Combine imeni V. I. Lenin, the Volkhov Aluminum Plant and the Novopolotsk "Polimir" Production Association imeni 50-letiya BSSR in utilizing secondary heat and energy resources is of interest. By utilizing secondary energy resources in production, these labor collectives saved approximately 25 million tons of reference fuel in 4 years of the Tenth Five-Year Plan.

However the scale of the effort to replace primary raw materials in production by using secondary material resources and to improve the ecological situation falls far short of the growing demands. The social division of labor and the transition to predominantly intensive economic development have resulted in the formation of a new branch of the national economy that collects, processes, transports and utilizes secondary resources.

The formation of the new branch is a long, complex process that demands first of all the development of a specialized technical base, a system of machines and effective technologies, the construction (or creation on the basis of the reconstruction of existing production facilities) of small modern enterprises and facilities for the initial processing, sorting and packaging, and the utilization of various types of secondary raw materials and waste for the production of quality products. Such examples exist in the form of enterprises producing cardboard packaging material from waste paper in the

vicinity of Leningrad and Kiev and metallurgical mini-plants operating on the basis of ferrous scrap metal.

Enterprises of this type should be situated in regions in which there are mass flows of secondary raw materials and in which the products made from these materials are consumed thereby eliminating the need for them to be transported an extra distance. Technical means and containers must be mass produced to permit the differentiated collection and delivery of secondary raw materials, including waste resulting from personal consumption. There is a need for a specialized subbranch of machine building with a powerful research and experimental-design base capable of developing fundamentally new technologies, and for the large-scale transition to new, structurally and qualitatively heterogeneous types of raw materials.

Decisions and organizational questions pertaining to the formation of the new branch of the national economy must be critically appraised. It would hardly be correct to concentrate under a single ministry or department the totality of the different subbranches comprising it. The technological and economic feasibility of such concentration must be correctly evaluated. In some instances (secondary ferrous metallurgy and secondary nonferrous metallurgy, for example), it is better to preserve them among consumer-branches, while in others (particularly those that use secondary raw materials based on personal consumption, it is better to establish combined enterprises and to make them subordinate to local Soviets.

It is also possible to form independent subbranches. But in any case there is need for a specialized union-republic ministry or department that would implement a uniform technical and economic policy on the formation and development of the new branch without regard to the departmental subordination of the enterprises comprising it. While USSR Gossnab is presently responsible for these functions, the circle of problems that exceed the competence of the organ responsible for the management of material-technical supply is gradually expanding.

We believe that it is also essential to resolve a number of questions associated with increasing the economic motivation to collect and procure secondary raw materials. It is hardly proper that procurement prices on most types of scrap ferrous and nonferrous metals remain the same in the face of a general increase in wholesale prices on the products of ferrous and nonferrous metallurgy. This has made it more profitable for metallurgical enterprises to use scrap metal, but has reduced the incentives for procurers and primary processors of this metal. There is a need for the well-conceived organization of the collection of secondary raw materials based on the extensive participation of youth, consumer cooperatives and trade; for the counter-sale of scarce commodities (similar to the organization of waste paper collection); for the dissemination of information; and for the establishment of branch and territorial "data banks" on secondary resources, their properties, sources of formation, and potential applications.

There should also be broader research, experimental and design work relating to the conservation and rational use of fuel, energy and raw materials; to the

introduction of low-waste and waste-free technologies; and to the utilization of secondary resources in production. New technologies should be developed in close cooperation with scientists and specialists of other socialist countries. Progressive foreign experience should be studied more actively. All this will substantially reduce the material-intensiveness of the social product.

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ECONOMIC MODELING AND COMPUTER TECHNOLOGY APPLICATION

SEARCH FOR NEW MANAGEMENT SYSTEMS--IMPORTANT MODELING TREND

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[Article by V. Levitskiy, candidate of economic sciences (Donetsk): "The Use of Optimization Methods in the Management of Enterprises and Associations"]

[Text] The development of effective forms and methods of managing industrial production and the improvement of production planning are key tasks in modern economic science. An important role in the realization of these tasks is assigned to mathematical economics which is being incorporated in management practice on the basis of the latest advances in computer technology.

Mathematical modeling of the management of industrial associations and enterprises is an intensively developing directions of the common research effort to develop qualitatively new management systems. In addition to successfully introduced models of direct plan calculations, various kinds of optimization problems are being quite widely addressed and solved. Positive, tangible examples of solutions of such problems were presented at the Second All-Union Conference on Optimal National Economic Planning and Management[1] held in 1983.

Optimization models of the sales activity of machine tool building enterprises; models of optimal counterplans of associations that take into account random factors and deadlines for the most important types of products; and optimization models of organizational structures of management in the subbranches of ventilator construction and power facility repair are of theoretical and practical interest. The programs in use are also extremely varied, ranging from the well-known PPP LPT/360 program (used in the "NKMZ" Production Association) to the PMP ASU (a package used on the YeS-1040 computer to optimize the distribution of pilot production plans.

In recent decades, the joint efforts of scientists and production specialists have laid firm scientific and methodological foundations for making the transition from conventional to highly automated management technology. At the same time, many mathematical economics models still cannot be considered a part of existing management systems. They have not yet become an everyday working tool of management. Some of them (the ones with the fewest bugs) are used sporadically while others are still in the experimental stage.

Analysis shows that existing management systems at enterprises and in associations that use computers are primarily--both from the standpoint of organization and method--oriented toward problems of an accounting and analytical nature, toward engineering and design problems. When this is the case, a "computerized management system becomes an auxiliary tool that can hardly be considered an enterprise management system."[2] Production management continues to be the bottleneck in the use of mathematical models and methods. As a rule only direct plan calculations are made to determine the need for various types of resources for plan variants formulated by conventional means. While the share of optimization planning problems in management systems of Ukrainian SSR ministries and departments is less than 5.5 percent of the total number, this indicator for many enterprises and associations is much lower.

Let us examine certain basic qualitative characteristics of the application of optimization problems in industrial management systems. We are thinking about enterprises and associations in which priority complexes or the next phases of computerized management systems have become operational, the structure of functional and support subsystems is fixed, and the objectives and their economic effectiveness have been defined. Analysis of the structure of these systems shows that many enterprises and associations are still not making sufficient use of optimization in reaching their most important decisions. At some of them, this effort has either not yet commenced or else has been halted for various reasons (which will be discussed below). Many objectives have been realized through linear programming methods based on individually developed software while others have been attained through the use of standard software packages. The basic effort has been carried out at the enterprises themselves. The labor entailed in some aspects of optimization problems runs into the several tens of man-years and the labor requirement for their solution is still high. Given the considerable difference in the economic effect of individual solutions (ranging from several thousand to millions of rubles), there are substantial reserves for raising the average effect above its expected level.

At many enterprises, the data base required for solving practical planning problems is still in the formative stage: data bases incorporating the necessary norms and document flows do not always contain the information required to make the calculations. Such parameters as the labor required to prepare raw data for inputting into the computer and the accuracy of the data can be significantly improved with the use of state-of-the-art computer technology.

Too little use is made of standard solutions in optimization efforts geared to the specific conditions of specific industrial facilities. This lowers the effectiveness of optimization work to a certain degree. It sometimes happens that optimization efforts (including mathematical economics models and algorithms) are not applied in practice for long periods of time. At the enterprises proper software is developed at a slow pace or not at all due to the shortage of specialists, while finished software packages are not utilized for various (sometimes, subjective) reasons.

Clearly the industrial management systems in which the main planning decisions are arrived at with the aid of sophisticated models and methods, in which the technology for forming information flows relating to the optimization of plans has been substantially improved, can be unreservedly categorized as ASU's [computerized management systems]. It is specifically the real potential of the planning function (all types of support for planning) as the basic nucleus of management as a whole that determines the "face" of any management system and computerized planning is the "face" of any ASU. Industrial managers are unquestionably primarily responsible for the level of utilization of methods for optimizing production plans, for the diffusion of optimization experience to kindred enterprises, for the effectiveness of optimization, etc. However, the reasons for the not always satisfactory state of affairs in this area obviously lie somewhat deeper. It is not by chance that some developer-enterprises that previously employed the optimizing approach to planning are today less interested in it. The question can be posed as follows: what is the reason for the low efficiency of some mathematical models given the uniform economic essence of their goal orientation (in the sense of the maximization of the planned effect) and the very diverse specifics of the modeled economic objects and processes for enterprises and associations in various branches of industry? And in this regard, why is the effectiveness of mathematical programming methods in the realization of plan tasks not sufficiently high at the enterprises where they are used?

In order to answer these and other questions, it is sufficient to present an enlarged list of the conditions that must be taken into account if there is to be any hope for success in the practical utilization of such methods in the management of production. Since optimization efforts cannot function in terms of organization and information (in the case of integrated data bases) in isolation from the rest of the ASU, the cited conditions are evidently of a general nature both for an individual effort and for complexes of efforts. They include above all: the necessary specialist cadres; the existence of precise, contradictory economic formulations of the effort based on guidelines and mandatory targets assigned by higher authority; the existence of systems of high quality models and methods that describe regularities of real situations; the existence of information and technical support systems; the testing of efforts as part of the needs of the management apparatus; and the precise regulation of organizational and legal relations of personal elements in enterprise control and executive systems based on computer data.

Only with the existence of these substantively necessary conditions and only when the specifics of every tangible object are taken into account can the transformation of new methods into conventional methods, into well developed elements of the production management system be productive. If we analyze the state of introduction of individual mathematical economics elaborations from the standpoint of the system of generalized conditions, in each specific instance it will be easy to see the precise dependence of the results on these conditions. Analysis shows that the methods of linear, nonlinear and dynamic programming; simulation; and inventory control theory are used effectively in the formulation and solution of various optimization problems. However the principal difficulties confronting the users of these methods stem not from known software limitations but from the inferior quality of formulation of the economic problems and the models employed.

The level of models (content and form) of practical optimization of plan decisions for the needs of production lags substantially behind the development of software proper--methods for working various models on the computer (the simplex method, gradient methods, etc.). The overcomplication of models with numerous factors, their failure to take significant demands fully into account, disproportions in the utilization of the ingredients of production, the not always correct reflection of the specifics of modeled economic objects, processes, etc.--all these factors frequently attest to the deficient (mathematical) formalization of actual situations. In such situations, the results cannot have a high degree of practical value or scientific validity. (Occasionally this is specifically how attempts are made to prove the mathematical strictness of the results). The most important demands (reflecting indicators and economic norms ratified by higher-level organizations) that must be included in long-range and short-term plans for the economic and social development of associations and enterprises, for example, are well known. Nonetheless, it is clearly not enough to model these conditions alone without regard to the specifics of actual types of production.

Why are models of optimization of plans for large machine building associations and enterprises with small series and one-of-a-kind production not entirely effective? Essentially, they correctly reflect the principal constraints connecting the basic indicators of activity for the chosen planning horizons: for production, labor and social development; for finance; for the activation of production capacities; for material-technical supply. Nonetheless, the basic drawbacks to such models are the imprecise, incomplete economic formulation of the problems and their failure to take the specific features of production fully into account. The first drawback is the replacement of a complex model of the plan itself for a specific calendar period by a simplified analogue (vector) of the model reflecting only the mix and the quantity to be produced in that period. This model does not contain information on planned end results of production for subsequent periods (after all, certain resources must be used to secure these results in the current period). The second drawback is that the models do not fully take into account the influence of the duration of production cycles on the distribution of the volume of work over periods of time. This essentially means ignoring continuousness in the performance of different amounts of work in time. As a result, considerable backlogs of carried-over billet fabrication, machining and assembly work are not directly modeled. The third shortcoming in these models is that they do not fully take into account the potential for maneuvering resources. This factor (the interchangeability of various types of machine tool equipment) is both important and essential to the identification and utilization of production reserves in the formulation of current plans that take numerous mandatory targets into account. The noted shortcomings, in particular, are found in optimization models of current planning of production at such Donbass machine building enterprises as the Donetsk Plant imeni Leninist Komsomol of the Ukraine, the Gorlovka Plant imeni S. M. Kirov, the Druzhkovka Plant imeni 50th anniversary of the Soviet Ukraine, the Novokramatorsk Plant imeni. V. I. Lenin, etc.

The use of even tested mathematical programming methods in the realization of models of such quality are unable to produce practical results on a par with

computers. At the same time, it should be noted that the elimination of individual shortcomings in models is by no means always a trivial problem. Ways of improving this most important sector of modeling were examined in considerable detail at the all-union conference previously referred to.

We also note the limited potential of optimization models in another respect. Industrial facilities do not as a rule have large reserve capacities. The obligatory inclusion of a large number of mandatory (ratified) targets in the plans violates the necessary proportions in remainders of free resources. Under such conditions, it is extremely difficult to strike even a mathematical balance of production components: there is less possibility for the economic maneuvering of resource compensators, for example, the interchangeability of equipment, etc.

The inadmissibility of numerous plan variants (in a mathematical sense) generated by numerous targets issued by higher organs is a factor that has an entirely explicable nature. These targets form at the branch level when the examination of the potential of individual industrial enterprises is too highly consolidated. When targets are broken down at the local level, it becomes substantially more difficult to maneuver leftover resources. Mathematical methods and models are of little practical use here: only an insignificant part of the product can be additionally included in the plan in the event resources are in short supply. Thus in order that the models substantially reflect actual pre-plan situations, the area of search for optimal solutions must be narrowed. Therefore enterprises frequently reach the hasty conclusion that the optimization approach is practically to no avail: minor increases in economic effect contrary to expectations only disappoint the developers and direct users of the models--production specialists.

The fact that there is a certain measure of separation between optimization models and the decisions that are used for other management functions (accounting, oversight, analysis, regulation) and their lack of orientation (especially the individual models) toward the manysided post-optimization analysis of computer variants of plans revealing important patterns of economic relations between production components in future periods should be considered a common shortcoming in the models. The establishment of an effective, sufficiently formalized (for example, simulated) system for evaluating the degree to which models directly conform to the actual modeled situations before they are used in day-to-day work could be of great assistance to both developers and users.

Known factors of a so-called external order impede the effective application of optimizing solutions. There are cases when the adopted production schedules are for the branch organs not the ones they themselves have ratified by law. Or, for example, by the end of the current year, enterprises are still frequently not informed on many items in the plans for future periods. And yet it is extremely important for plants with small series and one-of-a-kind production (heavy, coal machine building enterprises, etc.) to have data beforehand to enable them to conclude contracts because it takes a long time to tool up for the production of large items. Under the existing statute, enterprises are obligated to formulate material supply programs for production

before the plan itself is formulated (for example, requisitions for the most important resource--metal--must be submitted in August). Plans are communicated at best to the enterprises on the eve of the new year and even as late as January (despite the fact that the draft national economic plan is essentially ready as early as July or August, is ratified at the end of the year whereupon it becomes law for branch organs). This is how things stand today. All this is the result of an overprotective attitude toward enterprises which stems from the lack of proper organization of multilevel computerized management in "branch-association-enterprise" systems. And even in the experience that has been amassed[3] in the functioning of two-level "branch-enterprise" systems, today there are still numerous examples of the practical solution of this problem relative to the optimization of planning in the interaction of calculations in ASUP's [computerized enterprise management systems] and OASU's [branch computerized management systems].

Changes and adjustments in targets with respect to mix, time schedules, individual indicators, resources, etc., are unquestionably inevitable if they are economically justified. Therein lies the essence of the regulatory influence of higher level organs on lower level management systems. However in economic practice, there are still frequent instances in which plans are adjusted downward without the objective need to do so.

The decree of the CPSU Central Committee and USSR Council of Ministers "On Additional Measures Giving Broader Powers to Industrial Production Associations (Enterprises) in Planning and Economic Activity and in Increasing Their Responsibility for Performance" (1983) called for a large-scale economic experiment. Top leaders of two union and three republic ministries have been made personally responsible for the experiment. The elimination of the undue guardianship of enterprises and associations by ministries coupled with increased responsibility at the local level will increase the possibility of the more successful introduction of effective optimization methods in the decision making process in planning.

Mathematical models and methods are not a universal means for solving all management problems. The purpose of using them is to increase the efficiency of management organs. It must be said that they still encounter obstacles of and organizational and psychological nature and that there are inevitable difficulties in the struggle between the traditional and the new and more progressive. Many of these difficulties stem from the fact that the actual process of introducing mathematical economics concepts has not yet been sufficiently studied and that there is no effective process for controlling them. The use of the trial and error method in the introduction process is either doomed to failure or else generates an unfavorable situation at the enterprise itself in that it reduces the motivation to try something new and delays the recognition of the necessity and importance of numerous support measures. Such an atmosphere is favorable not only to all manner of skeptics, but also to the more active opponents who even view the newly introduced methods as a rival because the latter contradict the traditional technology of management procedures. "The problem was not just the known psychological barrier--the specialists were not used to 'trusting' a machine.

And indeed, 'electronic guardianship' was not to the liking of all plant managers...some were extremely vocal about the undermining of their authority."[4]

The position taken by enterprise management is a key factor to the successful optimization of plan calculations. This thesis is not new. But it frequently continues to be a slogan rather than a practical means. The enthusiasm and initiative of individual performers will be multiplied many fold if managers themselves become the initiators of the use of mathematical economics concepts that participate directly in the formulation of goals, in the formation of the principal economic-production demands. on the development and "finishing" of the basic models of production planning in actual situations.

The noted shortcomings both in the organization of research and in the practical utilization of its findings are evidence of the great potential that exists. The efforts of specialists in science and production must be directed toward the search for constructive ways of intensifying the assimilation of new methods in the management of production.

Enterprises and associations, as primary production cells, are always compelled in one way or another, to solve problems of a more special order than organs of branch management. Not one of these objects can be examined outside the branch management system as a whole. Therefore the elaboration of systems of models of multiple-level centralized planning is, practically speaking, a top priority task in improving the use of optimization methods in substantiating planning decisions in the chain of "branch-subbranch-association-enterprise" links. The theory of the mechanism for coordinating the behavior of the branch economic system on the whole with the behavior of all its subsystems (given the priority of the interests of the branch) is still in the formative stage in many aspects: mathematical economic, informational, organizational, etc. At the same time, where there is serious research on the design of multiple-level automated systems (in machine building, for example: management and automation systems); where management shares responsibility for the practical organization of the effort, enterprises and associations can be expected to produce tangible results in this direction. So it is that the "Lvov," "Barnaul," "Kuntsevo," "Svetlana" and a number of other systems have gained renown.

In order to accelerate the use of optimization methods in practical work, there is a need for a qualitative jump in the technology of developing a practical apparatus (the design of adequate models). Both individual models with a fixed structure and models with more universal designs--computer-generated models with built-in simulation units based on elements designed for standard types of production should be introduced. At the same time, the formulation of the objectives of any base model must not be based on a preference for any one objective function since the qualitative aspect of the solution of an economic problem is always characterized by not one but many "optimality criteria."

Why should our unflagging attention be devoted to the optimization approach? It must be acknowledged that the principles of optimal planning, in addition to their practical orientation, play no little ideological role in improving a

socialist economy. They promote the more complete disclosure of its advantages. The development of an optimally functioning economy is a very important, highly complex problem. The only way to solve this problem is not to improve separate parts but to improve the entire macroeconomic system--the total diversity of production, material, technological, informational, and other relations between its elements. "It is not surprising that many scientific formulations in this most complex area of research have not been brought to the stage of practical recommendations even though a number of practical results have already been produced."[5]

The modern conception is such that a system of hierarchically coordinated models is constructed instead of an immense optimization model of the nation's economy in accordance with the structure of the national economy. Each model describes a certain economic subsystem of a corresponding level and depicts information with varying degrees of detail: resource potential, aspects of activity, goal orientation (demand, production, consumption, scientific-technical progress, etc.). Such models are constructed for all types of entities--regions, agroindustrial and other complexes, branches, associations, and enterprises. At the same time, software is being developed for coordinating the interaction of all models in such a system that takes "vertical" and "horizontal" national economic relations into account. Management norms are also improved with respect to different modes of their impact on economic objects--economic, legal, administrative, and moral norms. This system of models is designed to optimize the management of the economy as a whole. The system clearly has no counterpart in world practice in scale, complexity or design properties. It is for this very reason that the conference's recommendations pointed to the following as the most important directions of research: raising the level of coordination of plans in conjunction with the rational combination of centralized planning with the development of the economic independence of enterprises and associations; the coordination of systems of indicators, goals and resources; the coordination of models at various levels of the hierarchy and the coordination of plans to form a unified system; the development of new modeling means; increased emphasis on methodological and organizational-legal support for the use of mathematical economics methods and computers in planning based on optimizing calculations.

It should be noted that modern demands on the realization of these calculations in models cannot be effectively fulfilled by the conventional problem-by-problem approach: one model for one problem. "The optimization of management in ASUP's cannot be based on individual models and methods...Traditional approaches to optimization problems are usually ineffective in ASU's."[6] Planning decisions as projections of the future are essentially always multiple-level hierarchical systems (and models). Therefore the demand to increase the correspondence of the model to the situation modeled must be realized in a fundamentally new way--through systems optimization (a system of models for one problem).

This concept advances as basic the principle of "complexing models (as modules) to form a whole function of modeling as a tool used in analysis, forecasting, planning, and programming with a developed multiple-level system of reciprocally coordinated information-algorithmic languages and information

information systems corresponding to them."[7] Adjustments of objectives; the formation of new conditions; the modification of previous constraints; the utilization of experience; the more precise definition of the directions of search for planning solutions; the use of the informal knowledge of specialists; the collective elimination of conflict situations (incompatible terms in the problems), etc.--these and other fragments of the dialogue between specialists and computers (and through computers, between one specialist and another) demonstrate the basic difference between problem-by-problem optimization and systems optimization. Systems optimization means the mandatory inclusion of responsible specialists (formulators of problems, developers of models, practical economists, heads of subdivisions) with their various professional interests in the capacity of principal (decisive) elements in a computerized system for the management of an industrial object. The realization of such a constructive approach in associations and at enterprises will make it possible to resolve many important questions relating to both modeling and organization. This will unquestionably accelerate the introduction of the optimization approach to the management of industrial production. Clearly, all these questions cannot be resolved all at once. On a statewide scale, they are resolved in proportion to the existing potential and the level of elaboration of individual problems. At the same time, events show that much can be done even now at the level of primary economic links--associations and enterprises.

In conclusion, we note that scientifically substantiated recommendations, guidelines and materials will always produce the desired effect if the atmosphere of formal work on optimization in the direction of direct interest in them is changed and if leaders of all ranks feel the need for the bold resolution of the most important practical production management problems.

FOOTNOTES

1. See: EKONOMIKA I MATEMATICHESKIYE METODY, Vol 19, no 5, 1983, pp 929-938.

2. See: N. G. Chumachenko and R. I. Zabotina, "Ekonomicheskaya effektivnost' ASUP" [The Economic Effectiveness of ASUP's], Moscow, Statistika, 1977, p 46.

3. G. I. Marchuk, A. G. Agangebyan, I. M. Bobko, et al, "Adaptivnaya sistema ASU proizvodstvom (ASU "Sigma")" [An Adaptive System of Computerized Production Management ("Sigma" ASU)], Moscow, Statistika, 1981, 176 pp.

4. PRAVDA, 30 October 1983.

5. N. Ye. Kobrinskiy, Ye. Z. Mayminas and A. D. Smirnov, "Ekonomicheskaya kibernetika" [Economic Cybernetics], Moscow, Ekonomika, 1982, p. 221.

6. See: V. V. Shkurba, "Sistemnaya optimizatsiya i modelirovaniye v upravlenii proizvodstvom. Tezisy dokladov toy zhe konferentsii. Sektsiya V" [Systems Optimization and Modeling in the Management of Production. Theses of Reports Presented at the Conference. Section V], pp 192-93.

7. Ibid.

REGIONAL DEVELOPMENT

KAZAKH, UZBEK GOSPLAN CHAIRMEN REVIEW 1985 PLAN TARGETS

Kazakh Plan Targets

Alma-Ata NARODNOYE KHOZYAYSTVO KAZAKHSTANA in Russian No 1, Jan 85 pp 3-11

[Article by T. Mukhamed-Rakhimov, deputy chairman, Kazakh SSR Council of Ministers; chairman, Kazakh SSR Gosplan; passages enclosed in slantlines printed in boldface]

[Text] One more year of work in our republic's history is behind us. Every day more and more working people are participating in the competition to implement the party's economic policy, to ensure a worthy observance of the 40th anniversary of the Soviet people's victory in the Great Patriotic War and the 50th anniversary of the Stakhanovite movement. The working people of the Kazakh SSR will greet the forthcoming 27th CPSU Congress with new feats of labor.

Kazakhstan's economy continued to develop at an accelerated pace last year thereby making it possible to strengthen its production and scientific-technical potential considerably. The result was that productive fixed capital increased by 19 billion rubles in 4 years of the current five-year plan alone and almost reached 87 billion rubles.

The volume of industrial production for the year increased by 3.3 percent; the total increase for 1981-84 was by 13.8 percent. There were increases in the production of coal, oil, electric power, steel, nonferrous metals; in production in the chemical and petrochemical industry; and in the production of consumer goods.

Agricultural workers are making their worthy contribution to the nation's Food Program. In 4 years of the current five-year plan, they have sold 49.2 million tons of grain, 5.7 million tons of livestock and poultry, 9.6 million tons of milk, and many other types of products to the state.

Notwithstanding extremely adverse weather conditions, the republic procured more rice, buckwheat, sunflower seeds, raw cotton, sugar beets, potatoes, vegetables, melons, livestock, poultry, milk, karakul and other fur and peltry than in 1983.

As in previous years, there was a concerted effort to strengthen agriculture's material-technical base. Almost 3.4 billion rubles in capital investments were allocated for the comprehensive development of this key branch. Egg-producing poultry factories (to accommodate 251,000 laying hens), meat-producing poultry factories (to accommodate 2.5 million head of poultry), and other agricultural facilities have been put into operation.

The republic is engaged in a large-scale capital construction program. Last year, it utilized approximately eight billion rubles of state capital investments. Approximately 70 key production capacities and facilities were put into operation. Among them: power unit no. 8 at Ekibastuz GRES-1 [GRES -- state regional electric power plant]; the Travniki-Kustanay petroleum products pipeline; the Chimkent Oil Refinery; the Chilisayskiy Phosphorite Mine; capacities for the production of rare-earth products at the Irtyshskiy Chemical-Metallurgical Plant; capacities for the extraction of phosphorite ore in the Karatau Production Association; Concentration Mill No 3 at the Dzhezkazganskiy Mining and Metallurgical Combine; the second phase of the Novo-Karagandinskiy Cement Plant; the Kzyl-Orda Nonwoven Materials Mill; the Kokchetav Porcelain Plant, and others.

The indicated social program is being successfully implemented. Approximately 19 billion rubles -- three-fourths of the national income -- have been allocated for public consumption. Compared with last year, the average wage of blue- and white-collar workers increased by 2.8 percent; wages of kolkhoz workers increased by 2 percent. More than seven billion rubles were in the form of various kinds of payments and benefits that the population received from social consumption funds. Last year, additional material incentives were instituted for agricultural workers, additional pay was introduced for teachers and other public education personnel, and child care grants were established for working mothers.

Retail turnover in state and cooperative trade increased by 4.3 percent; the sale of consumer services increased by 6.9 percent. A combined total six million m^2 of housing was put into operation thereby improving the housing conditions of more than 600,000 persons.

The republic's smallest citizens were presented with preschool institutions with accommodations for 34,500 children. General education schools with accommodations for 67,300 pupils were put into operation. As a result, enrollment in preschool institutions was raised to 980,000; enrollment in schools was raised to 3,036,000. Higher and secondary specialized educational institutions trained 121,100 specialists last year. Hospitals with 2200 beds were put into operation.

Efforts to protect the environment and to make rational use of natural resources were intensified. Spending on these measures was increased by more than one-third during the year.

However, when we speak about successes, we must also mention our shortcomings. Enterprises belonging to the Kazkh SSR Minergo [Ministry of Power and Electrification], Minstroymaterialy [Ministry of the Construction Materials

Industry], Minmyasomolprom [Ministry of the Meat and Dairy Industry], Minlegprom [Ministry of Light Industry], and Minplodoovoshchkhoz [Ministry of the Fruit and Vegetable Industry] did not satisfactorily fulfill their plan targets last year.

Notwithstanding the aid it has received, the republic's Minergo is functioning with interruptions and the work of other branches of the national economy has been adversely affected as a result.

The shortfall in the supply of construction materials to customers is considerable. The republic's Minstroymaterialy is indebted for millions of rubles' worth of commodity output since the beginning of the five-year plan.

As a result of the slow rate of development of capacities, in 1984, the shortfall in the industrial output of the Minlegprom was in the amount of 368 million rubles compared with five-year plan targets. There was also a shortfall in the supply of sewn goods (44 million rubles), leather footwear (almost 4.5 million pairs), and a sizable shortfall in the supply of porcelain ware, nonwoven materials, and other products to the population. What is more, their quality also deteriorates from year to year.

Last year, the Minplodoovoshchkhoz underfilled its five-year plan target for the production of canned goods by 51 million standard cans; its grape wine target -- by 240,000 decaliters; and its targets for other products.

Schedules are frequently not met and resources are not entirely utilized in capital construction. Mintyazhstroy [the Ministry of Construction of Heavy Industry Enterprises], Minsel'stroy [the Ministry of Rural Construction] and Glavalmaatastroy [Main Administration for Construction in Alma-Ata] to this very day have been unable to overcome the affliction of scattering manpower and resources. As a result, many construction projects in Semipalatinsk, Turgay, East Kazakhstan, Guryev, Dzhambul, and other oblasts are failing to meet their capital construction plans.

The republic's railroads are still not satisfying its need for the shipment of national economic freight.

Not everything has been done to secure stable high yields in agriculture. Losses in harvesting and shipping continue to be high. Some sovkhozes and kolkhozess are not securing the integrity and effective use of farm machinery and equipment.

Every ministry, department, enterprise, construction organization, sovkhoz, and kolkhoz should analyze derelictions in earnest and should draw the appropriate conclusions in order to improve all work in the future, to effect greater economies, and to improve methods of management. Only then can we be certain that the final year of the five-year plan and the entire five-year plan as a whole will be successfully completed.

Key Problems in the Economic and Social Development of the Kazakh SSR in 1985

The republic state plan for 1985 takes into account the statements and conclusions of Comrade K. U. Chernenko, general secretary, CPSU Central Committee; chairman, Presidium, USSR Supreme Soviet, on the development of the economy and social policy, and the analytical findings regarding the present state of Kazakhstan's economy presented at the 14th Plenum of the Kazakh CP Central Committee by Comrade D. A. Kunayev, member, Politburo of the CPSU Central Committee; first secretary, Kazakh CP Central Committee. The plan is oriented toward the increased intensification of the economy based on the higher technical level of production, the more proportional development of branches, and the more complete utilization of the existing scientific-technical and production potential. This year's rate of development of the national economy is consequently higher than the rate set for 1984.

The change in the proportions of use of national income is a unique feature in the new plan. It is planned to use 74.3 percent of the national income for the needs of consumption in the current year compared with 72.3% in 1984. There will be further equalization of the income levels of blue-collar, white-collar and kolkhoz workers and existing differences in the level of housing, municipal services, cultural, consumer, and medical services for various social groups will also be obliterated.

There is heightened attention to the integrated development of the economy of republic oblasts and to improving the location of the productive forces.

The accelerated introduction of scientific-technical progress into practice is the most important condition to the intensification of the economy. Therefore the plan for the current year orients the republic's economic organs toward the realization of this principle. Accordingly, republic scientific organizations, ministries and departments, associations and enterprises will take part in the execution of 93 special integrated scientific-technical programs and programs relating to the resolution of the most important scientific and technical problems ratified by USSR Gosplan, the USSR State Committee for Science and Technology, the USSR Academy of Sciences, USSR Gosstroy, and union ministries and departments. They call for the implementation of 39 measures to incorporate fundamentally new technological processes and equipment in practice. Special attention is devoted to the acceleration and introduction of energy- and material-saving technologies, to the reduction of the use of manual labor in the national economy, especially in industry and in auxiliary work.

Targets for raising the technical level of production occupy an important place in the plan. Branches subordinate to the Kazakh SSR Council of Ministers alone are scheduled to introduce 200 mechanized flow, totally mechanized and automated lines and to mechanize 200 shops, sectors and production facilities entirely.

These measures will make it possible to increase republic national income by 5.9 percent, which will comprise 21.6 billion rubles, and the volume of industrial production by 3.8%, which will amount to 30 billion rubles. Gross agricultural output will grow by 17.1 percent. The absolute growth of

national income, industrial output and agricultural output will surpass the corresponding indicators for the preceding year. It is important to note that

these targets are to be met with a correspondingly smaller increase in capital investments, material resources and labor resources.

The productivity of social labor is growing by 6.5 percent. This indicator will account for 90 percent of the increase in national income, 70 percent of the increase in industrial, the entire increase in agricultural output and the volume of construction and installation work, and half of the increase in the volume of freight shipping.

The development of republic industry in 1985 is primarily oriented toward the more complete satisfaction of the national economy's need for the means of production. It is accordingly planned to increase the production of Group 'A' products by 3.9 percent, while increasing the overall volume of industrial production by 3.8 percent. The projected rates are in line with five-year plan targets and surpass them for a number of items. The plan for the current years calls for surpassing five-year plan targets in the production of: thermal energy, machinery for animal husbandry and feed production, forges and presses, logs, commercial lumber, slate, pipe, couplings, asbestos-cement, soft roofing materials, ceramic floor tiles, cotton and silk textiles, hosiery, knitted outergarments, granulated sugar, and other products.

However (primarily as a result of the scarcity of raw materials and supplies and lag in the construction of a number of production capacities), in 1985 it will not be possible to attain the volume of industrial production indicated in the five-year plan. As a result, growth for the five-year plan period will be 18.9 instead of 23 percent.

In the draft of the plan, serious attention was devoted to improving the use of the production potential. As a result, the plan calls for the more complete utilization of the capacities of a number of enterprises and for reaching rated capacity in the production of coal, alumina, magnesium, titanium, farm machinery, metalcutting machine tools, certain construction materials, and light and food industry products. The projected measures must account for almost 97 percent of the increase in production at existing enterprises.

The production of a number of new producer and consumer goods is planned. In particular, the manufacture of new types of tractors, seeders, cultivators, machinery for cultivating solonetzic soil, lines for producing wire from powdered metal, rolled metal finishing machinery, decorative gypsum tiles, and other products.

Work to improve quality will be continued. The share of products bearing the Quality Emblemm in total output will be 12.4 percent compared with 11.5 percent last year.

In 1985, measures will be taken to resolve key problems in the development of basic industrial branches.

In keeping with the nation's /Energy Program/, the fuel-energy complex will undergo accelerated development in the current year. Electric power production will total 82.1 billion kilowatt/hours -- 10 percent more than last year. The increase will be primarily the result of the better utilization of the capacities of Ekibastuz GRES-1. The plan calls for the activation of 2250 kilometers of electric power transmission lines including the Agadyr-South Kazakhstan GRES 500 kilovolt line and the Monity-Saryshagan 220 kilovolt line. Two turbines are to be modernized at Petropavlovsk TETS-2 [TETS -- heat and electric power plant] and the Alma-Ata GRES, 14 boilers are to be rebuilt, and 19 substations are to be converted to remote control.

/Coal production/ in the current year will be increased by two million tons and will total 127.4 million tons. The planned increase will the result of the activation of the first phase of the "Vostochnyy" pit in the Ekibastuz deposit and the "Priozernyy" exploratory-operational pit in the Turgay Basin. Coal mining enterprises will step up work on the further mechanization and automation of production processes, in particular, on the basis of mechanized complexes and rotary excavators.

/Oil production/ will be increased through the more intensive development of oil fields on the Buzachi Peninsula, the activation of new Turkmenoy and Burmash fields and through increasing oil production in the Zhanazhol field. The plan calls for the activation of the second phase of the Zhanazhol complex, 739 oil wells and 5 gas wells in the Karachaganak fields, and the Akyrtyubinskoye underground gas storage facility; for expanding the Bukhara gas field - Tashkent - Frunze - Alma-Ata gas pipeline; and for commencing construction on the Gazli-Chimkent gas pipeline.

The /oil refining industry/ will undergo accelerated development. The volume of primary oil refining will grow by 20.7 percent compared with 1984. The increase will be the result of the activation of the first phase of the Chimkent Oil Refinery. The activation of a coking facility at the Pavlodar Oil Refinery is planned.

The /chemical and petrochemical industry/ will develop at a relatively more rapid rate. The volume of its output will increase by 7.6 percent compared with the previous year. Mineral fertilizer production will increase by 7.6 percent; yellow phosphorous -- 10.6 percent; sulfuric acid -- 21.9 percent; polyethylene -- 6.5 percent; chemical fiber and threat -- 4.4 percent; tires -- 1.6-fold; detergents -- 1.2-fold. This branch is planning the introduction of capacities for the production of dry-milled phosphorite flour and phosphorite concentrate in the Karatau Association, capacities for the production of yellow phosphorous and "RK" fertilizers in the Dzhambul Khimprom Association, and capacities for the production of reactive-frequency phosphorous salts in the Chimkent Fosfor Association. The Chimkentshina Association is planning the activation of capacities for the manufacture of large tires for trucks and farm machinery.

More iron ore, rolled metal and ferroalloys will be produced. As a result of the planned capital repair of blast furnace no 3 in the Karaganda Metallurgical Combine, no increase in steel and cast iron production is planned.

This year's plan calls for the activation of the Kentobe mine and the second phase of the Molodezhnaya Mine at the Donskoy Mining and Concentration

Combine, and for increasing the capacity of the tin shop in the Karaganda Metallurgical Combine.

In /nonferrous metallurgy/, the production of lead, zinc, titanium, and certain other metals will be increased. Nonetheless, the development of the branch will continue to be impeded by the insufficient supply of raw materials to enterprises. As a result, the production of refined copper and alumina will be reduced compared with last year. The raw materials base will be strengthened with the activation of ore extraction capacities at the Akchiy-Spasskiy Mine and the Zhayremskiy Mining and Concentration Combine and with the activation of ore processing facilities in the Dzhezkazganskiy and Zhezkentskiy combines. The plan calls for the development of rational processing systems. Work will continue on flowline technology for underground ore extraction in the Zyryanovskiy Combine. The enrichment process calls for improvement in technological systems and reagent regimes that increase the degree of extraction of metals and the total utilization of raw materials.

Republic geologists will be engaged in large-scale prospecting of mineral reserves, especially prospecting for oil, gas, coal, raw materials for mineral fertilizer production, and ferrous and nonferrous metals. In this regard, the /plan calls for increasing geological prospecting/ financed by the state budget by 1.5 percent and for a 22.4 percent increase in capital investments in deep exploratory drilling for oil and gas.

/Machine building output/ will increase by 6.8 percent and will total 4.9 billion rubles. More tractors, field crop machinery, machinery and equipment for animal husbandry and feed production, rolling equipment, forges and presses, transformers, metalcutting machine tools, excavators, bulldozers, and automation instruments and systems will be built.

The /development of the timber and wood processing industry/ is oriented toward the more complete utilization and processing of wood raw materials. Consequently, according to the plan lumber production should be increased by 29.1 percent; paper -- 1.8-fold; cardboard -- by 10.6 percent; splint-slab -- by 12.2 percent.

/Special attention will be devoted to expanding the production and improving the quality of consumer goods/. Consumer goods production in the coming year will total 11.6 billion rubles (in retail prices), which will surpass the five-year plan target. The production of consumer durables will increase by 4.8 percent.

/Republic light industry/ continues to be assigned a leading role in the production of [consumer] goods. (Light industry will produce one-third of the total volume of consumer goods). The 1985 plan calls for a considerable increase in the production of textiles, nonwoven materials, rugs and carpets, leather footwear, and knitted and sewn goods. The manufacture of products for children and goods that are in high demand will be increased and the quality

of footwear and clothing will be improved. The scheduled technical retooling of branch enterprises will facilitate the realization of this objective. Two thousand five hundred units of production equipment will be renovated and 37 totally mechanized flowlines will be put into operation. Under the plan, a spinning facility will be put into operation in Tselinograd, an affiliate of the Kentau Sewing and Knitwear Mill will be activated in Turkestan, and experimental sewing mills will be set up in Alma-Ata and other cities.

/Local industry will play a more important part/. Its output will be increased by 4.6 percent by 1984. Homeworkers will produce 8.7 percent more than last year; almost 15 percent more products will be produced from local raw materials and production waste. Small production facilities, affiliates and shops will continue to be sited in small towns and cities with available manpower; homeworker combines will be set up in Karaganda, Kzyl-Orda, North Kazakhstan, and Chimkent oblasts.

The decisions of the 26th Congress and subsequent plenums of the CPSU Central Committee emphasized that heavy industry, as well as light, food and local industry enterprises, must address itself to the question of expanding consumer goods production. The number of enterprises producing these goods for the first time is increasing from year to year.

Ministries, departments, and local organs of power must take every possible measure to secure the unconditional fulfillment of plans and the maximum, effective utilization of available reserves to this end.

The 1985 /targets for the development of the agro-industrial complex/ are for the most part aimed at implementing the Food Program's measures. This year's plan calls for the sale of 16.9 million tons (over one billion poods) of grain, 340,000 tons of raw cotton, 2.1 million tons of sugar beets, 650,000 tons of potatoes, 910,000 tons of vegetables, 1,520,000 tons of livestock and poultry, over 2.1 billion eggs, 58,500 tons of wool (clean fiber), and many other products to the state. These targets are roughly 1.2 times greater than the average annual volume of purchases under the 10th Five-Year Plan. In order to ensure the unconditional fulfillment of the plan, republic sovkhozes and kolkhozes will have to increase gross agricultural output by almost one-fifth compared with 1984, including sugar beet production -- 31.2 percent; potatoes -- 13.5 percent; vegetables -- 15 percent; livestock and poultry -- 1 percent; milk -- 8 percent; eggs -- 1.7 percent; and wool -- 4.6 percent.

As these figures show, agriculture (especially field cropping) faces complex tasks. It is therefore exceptionally important that all farms base their entire effort on scientifically substantiated field cropping systems; convert grain seed growing to an industrial footing; increase the area seeded with new varieties and hybrids; and introduce intensive technologies for growing rice and sugar beets.

Republic agriculture in the current year will be supplied with 1 ,050,000 tons of mineral fertilizers which must be used efficiently by each farm.

The decisions of the October (1984) Plenum of the CPSU Central Committee hold special significance for Kazakhstan. There are also shortcomings in our

reclamation program and in our use of irrigated land. A number of farms in the republic's southern oblasts do not always use irrigated land effectively and are guilty of large, nonproductive water losses. For this reason, the plan for 1985 calls for the expansion of reclamation construction. Seventy-four thousand two hundred hectares of new, irrigated land are to be put into operation, 1.8 million hectares of pasture land are to be irrigated, and 972 kilometers of agricultural water pipelines are to be put into operation. Crops on irrigated land will occupy 1,855,000 hectares, which will be 42,000 hectares more than in 1984.

The 1985 plan calls for the procurement of 15,084,000 tons of feed units, which is 2,645,000 tons more than last year. The further increase in the number of head of livestock and poultry is planned on the basis of a stronger feed base.

The capital investment allocation for the comprehensive development of agriculture is 3.6 million rubles. Sheep farm facilities to accommodate 500,000 sheep, poultry factories designed for 90,000 laying hens, poultry factories specializing in meat production (with a capacity of 3.1 million fowl), and other facilities are scheduled to be put into operation.

Republic kolkhozes and sovkhozes will receive 29,600 tractors, 15,500 grain harvesting combines, and a large number of trucks and other types of equipment.

In keeping with the decisions of the party, exceptionally great importance is attached to /land reclamation/. In 1985 the capital investment allocation for land reclamation is 700 million rubles; approximately 74,000 hectares of new irrigated land, 1000 kilometers of water pipelines and other projects will be put into operation.

The plan includes measures for the social development of the countryside, for further raising the level of agricultural workers' well-being, cultural and consumer services, and medical care. The allocation for the construction of housing and cultural and consumer service facilities for the rural population in 1985 is 750 million rubles. These funds will be used to build approximately 2.1 million m^2 of housing and many preschool institutions, clubs and culture centers.

/Subsidiary agricultural enterprises and organizations/ can and should play an important part in increasing food resources. There are now 1137 such farms. In 9 months of last year alone, they produced 32,000 tons of meat, 11,700 tons of milk, 13,000 tons of potatoes, and 7000 tons of vegetables. Every year the Karagandaugol' Association on the average produces 250-260 tons of meat, 700 tons of milk, 2 million eggs, and 200-250 tons of vegetables and potatoes. Every year, the Kazzoloto subsidiary farm produces more than 100 tons of vegetables, 260 tons of meat, 450-460 tons of milk for the combine's workers. Annual production per worker is almost 50 kilograms of meat and 90 kilograms of milk. The Shemonaikhinskoye automotive enterprise annually produces more than 18 kilograms of meat and 430 kilograms of meat per worker.

Unfortunately the leadership of ministries, departments and enterprises does not always devote the necessary attention to this important question.

Kazpotrebsoyuz [Kazakh Union of Consumers' Societies], for example, is not making satisfactory use of the waste of public dining enterprises and other food resources. As a result, meat production targets are systematically not met. In 1984, a little more than half of the quota of 55,000 tons of meat was actually produced. And Kazmezhkolkhozstroy [Kazakh Inter-Kolkhoz Construction Administration] even closed down one subsidiary farm in Dzhambul Oblast.

Subsidiary farms have been assigned more intensive production targets for the current year. Therefore ministries and departments must even now take energetic measures to see to it that they are met without fail.

/Food industry/ enterprises play an important part in the implementation of the Food Program. They are scheduled to increase production as follows: vegetable oil -- 16 percent; butter -- 1.5 percent; granulated sugar -- 4.8 percent; canned fruit and vegetables -- 25.3 percent; meat products -- 1.5 percent; and whole-milk products -- 3.88 percent. Raw materials must be processed to the fullest in order to meet these plan targets. The meat and dairy industry must use animal and vegetable protein food production and must use progressive technology so that 20,000 tons of meat can be released for sale to the population and 490,000 tons of milk can be conserved.

The branch's enterprises will expand the mix of children's and dietetic food substantially; will produce new types of canned goods, sausages, and dairy products; and will turn out more foods in packaged form.

This will require that the branch's material-technical base be strengthened. A bread-macaroni-confectionery combine will be put into operation in Karaganda, a bakery will be put into operation in the settlement of KIachar (Kustanay Oblast), construction of the Tasutkel'skoye fish farm will be completed, a soft drink shop will be rebuilt and expanded in Arkalyk; a shop will be rebuilt and expanded at an Alma-Ata brewery; a sausage shop will be rebuilt and expanded at the Ekibastuz Meat Combine; a sour cream and cottage cheese plant will be rebuilt and expanded at the Pavlodar City Dairy Plant, etc.

The further development of the flour, groat and mixed feed industry is planned. Flour production will be increased 1.8 percent; mixed feed -- 5.6 percent; and protein-vitamin additives -- 1.2-fold. Elevators will be put into operation at the Novo-Uritsk station in Kustanay Oblast, at the Sorokovaya station in Tselinograd Oblast and at the Sauly station in North Kazakhstan Oblast.

The /further development of all types of transport and communications is planned/. A great deal of work must be done this year to improve passenger and freight service.

The volume of rail freight shipping will grow by 3 percent; freight turnover will increase by 3.1 percent. More construction materials, coal, petroleum products, grain, and mineral fertilizers will be built. Passenger service will be improved. In 1985 the new Sayak-Aktogay rail line, 192 kilometers of second tracks and two-track inserts, and 126 kilometers of electrified track between Monity and Chu will be put into operation.

Truck freight will increase by 2.3 percent; general passenger bus service will increase by 2.4 percent. A bus park will be put into operation in the settlement of Leninsk (Kzyl-Orda Oblast); five truck pools will be put into operation in Aktau (Karaganda Oblast), and in Ekibastuz, Pavlodar, Uralsk, and the settlement of Dokuchayevka (Kustanay Oblast); and four service stations will be put into operation in Gurev and Martuk (Aktyubinsk Oblast), in Abay (Karaganda Oblast), and Shchuchinsk (Kokchetav Oblast). Common carrier transport enterprises will receive trucks with a combined carrying capacity of 63,000 tons, which is 10,600 tons more than the five-year plan estimates.

Local airlines plan to complete the construction of an airport in Zyryanovsk, to commence construction of an airport in the settlement of Turgay (Turgay Oblast), and to build a hard-surface runway at Kzyl-Orda Airport.

It should be noted that there are substantial shortcomings in the activity of the republic's transport ministries and departments. There is a great deal of idle time and the efficiency of utilization of railroad cars, trucks, ships, and loading-unloading equipment is low. There is little interaction between the shippers and receivers of freight. Transport organizations will have to make considerable efforts to bring about dramatic improvements in meeting the needs of the national economy and to make more effective use of means of transport.

In 1985 the 1300 kilometers of additional hard-surface motor roads are scheduled to be built. By the end of the year, there will be 77,800 kilometers of hard-surface roads. Sections of motor roads with the highest volume of freight traffic will be put into operation.

The volume of communications will grow by 4.5 percent. The Ministry of Communications will activate three television and a number of radio broadcasting stations, and urban automatic telephone exchanges for 64,000 numbers, and other facilities.

In the area of capital construction, the plan provides for increasing allocations for reconstruction and modernization, for reducing the number of construction start , and for improving the organization of construction.

The allocation of state capital investments for the development of the republic's economy in the current year total 8.3 billion rubles, which is more than envisaged in the five-year plan. The allocation for reconstruction and technical retooling of existing enterprises will be 774,600,000 rubles, which will be more than in 1984. The structure of capital investments will be improved. The further concentration of manpower and resources at priority projects is planned. More than 40 of the most important capacities and projects will be activated.

KaSSR Mintyazhstroy, Minsel'stroy and Glavalmaatastroy will increase the volume of contractor-performed work compared with last year. This will require the increased effectiveness of construction, the more rhythmic work of construction and installation organizations throughout the entire year, and the activation of capacities on schedule.

The plan envisages the further strengthening of contractor organizations and for the /expansion of the production base of the construction industry and the construction materials industry/ in order to supply the construction program with material-technical resources. This year the production of cement is slated to increase to 8.3 million tons (production in 1984 rose by 11.7 percent). The production of slate will grow by 2.3 percent; wallbuilding materials -- by 12.4 percent; soft roofing materials -- by more than 8 percent.

Construction will use progressive methods and new, effective materials more widely and will raise the level of prefabrication of construction projects. The scale of construction based on large-dimension elements, panels and blocks will grow by 2.6 percent; the construction of large-panel housing based on new-series standard designs will increase by 7.5 percent.

The construction of the Zhetybayskiy Shell Rock Quarry and the technical retooling of the Karaganda and Chimkent asbestos cement products enterprises and the Nadezhdinskiy Gravel Plant are scheduled for completion.

The realization of science and technology development targets will promote the increased effectiveness of social production and will make it possible to improve the use of labor, material and financial resources.

According to the 1985 plan, /labor productivity will be raised/ in industry by 2.7 percent; in construction -- by 2.4 percent; in agriculture -- almost 1.2-fold; and motor transport -- by 1 percent. For the majority of ministries and departments, labor productivity growth targets are determined either at the level of or higher than the projections of the five-year plan.

Compared with 1984, it is planned to reduce production costs first and foremost by raising the technical level of production, by improving the organization of the work, and by strictly economizing time, raw materials, supplies, and labor and financial resources.

The cost of construction and installation work will be reduced primarily by increasing the degree of prefabrication of buildings and structures, by using new, more effective materials, by increasing mechanization and by using machinery and mechanisms more effectively.

All these measures should produce a profit of 4.8 billion rubles in the republic's economy or 1.7-fold more than in 1984.

The 26th CPSU Congress program for further improving the well-being of the Soviet people will continue to be implemented this year.

Approximately 19.6 billion rubles or three-fourths of the national income will be allocated for the needs of public consumption. Real per capita income will grow by 3 percent; the average wages of blue- and white-collar workers -- by 1.8 percent; kolkhoz workers -- by 3.3 percent. In addition to earned income,

the republic population will receive 7435 million rubles in the form of various kinds of payments and benefits from social consumption funds or 4.5 percent more than in the past year.

The plan envisages additional spending by the state on bonuses for motion picture network personnel and the implementation of measures relating to additional material incentives for agricultural workers, on raising the wages of public education personnel, on raising the state's child care aidfor working mothers, and on other social measures.

According to the plan, /retail trade will be increased/ by 5.6 percent in state and cooperative trade. This year, the sale of goods will be increased by 15.9 billion rubles. This is no easy task.

After all, the republic's Mintorg [Ministry of Trade] and Kazpotrebsoyuz are not yet coping with trade turnover plans. The frequent reason for this is the poor organization of trade. For example, checks reveal that the assortment of goods in one-sixth of the Mintorg stores and one-third of the Kazpotrebsoyuz stores is incomplete. They also showed that fats, pasta, fresh frozen fish, juices, salt, sugar, cookies, thread, and many other goods available at [wholesale] bases were occasionally not available in the stores. The rules of trade are frequently violated, in particular, stores are closed under various pretexts for long periods of time. The work of Mintorg wholesale organizations is also unsatisfactory: they distribute stocks among oblasts unevenly; their shipping schedules are irregular; they are inept in maneuvering the commodity resources of oblasts and trade organizations.

The /volume of sale of consumer services/ to the population is to be raised to 502 million rubles or six percent more than in 1984. The volume of consumer services in rural areas will be increased by 6.8 percent. Measures will be instituted to improve the quality of services. We cannot fail to mention the fact that despite a number of positive changes in the KaSSR Minbyt [Ministry of Consumer Services], last year one-third of itis enterprises did not meet their plan targets. There is a considerable difference in the level of consumer services between rayons in Aktyubinsk, Kokchetav, Semipalatinsk, Taldy-Kurgan, and a number of other oblasts. The work of integrated receiving centers is poorly organized especially in rural areas. Half of them do not offer haircutting services, 70 percent are not staffed by household appliance repair specialists; 75 percent are not staffed by photographers. Consumer durables are not offered for rent at 68 out of 100 centers. The level of service is frequently low. The republic Minbyt and other ministries and departments responsible for consumer services must fundamentally correct matters in order to satisfy all the population's needs.

A combined area of 6.3 million m^2 of /housing is scheduled to be put into operation in 1985/. The growth of housing construction will be financed by housebuilding cooperatives. The average living space of the republic's population will be increased. Public utilities will be improved. Almost 90 percent of all socialized housing in cities will have running water, 88 percent will be connected to a sewer line, 88 percent will have central heating. More rural homes will be connected to gas lines.

/Public education and culture will undergo further development/. Enrollment in daytime general education schools will be 3,053,000 pupils. In preschool institutions the enrollment will be 1,030,000, which will be 5.1 percent higher than the 1984 level. The availability of these institutions to the preschool population will rise from 50.7 percent in 1984 to 53 percent. General education schools with 76,000 places and kindergartens and day care nurseries with 32,300 places are scheduled to be built. Higher and secondary specialized educational institutions will graduate 129,300 specialists and assign them to work in the national economy. More skilled blue-collar workers will be trained.

The plan provides measures for the improvement of cultural and educational services to the republic's population. They include the organization of four museums and a puppet theater in Dzhezkazgan, the opening of scientific restoration shops in Arkalyk and Kokchetav, and 5 parks. The volume of television and radio broadcasting will also be increased.

/Medical care will be improved/. The hospital network will increase by 3400 beds. There will be an increase in the number of physicians. The plan calls for the activation of six 590-bed rayon hospitals, three 660-bed urban hospitals in Kokchetav, Aktyubinsk and Petropavlovsk, one multispecialty 300-bed children's hospital in the village of Aksay (Alma-Ata Oblast), seven polyclinics with a capacity of 2800 outpatients a shift, a 240-bed tuberculosis sanatorium, and other health care facilities.

/The plan provides for further improvement in nature conservation and in the rational utilization of natural resources/. The capital investment allocation for this purpose to the economy subordinate to the KaSSR Council of Ministers alone will be 93.4 million rubles. Purification facilities with a total capacity of 44,000 m^2 a day and a system capable of circulating 295,000 m^3 of water a day will be built. An installation for trapping and neutralizing harmful components of exhaust gas at a rate of 2.2 million m^3 of gas an hour will become operational.

Considerable erosion control measures will be carried out on sovkhozes and kolkhozes with the aim of preserving the integrity and improving the quality of the land. Almost 11,000 hectares of land are scheduled for recultivation. The biological method of controlling pests and diseases of farm crops will be applied over a larger area. More will be spent on the protection and reproduction of wild animals and birds.

/The plan for 1985 makes provision for a number of measures to promote the coordination of plans/. Calculations show that certain difficulties will remain in satisfying the needs of production and capital construction for rolled metals, lumber, fuel, and other material-technical resources. Accordingly it will be necessary to reduce average norms governing the expenditure of rolled ferrous metals in machine building and metalworking by 2.4 percent; steel pipe -- by 1.5-2.5 percent; electric power -- by 3.2 percent; thermal energy -- by 1 percent; and boiler and furnace fuel -- by 5.3 percent. Strict economy targets have been set for the expenditure of other types of material resources. For this reason, /this year's plan calls for the use of considerably more waste material in production/. The use of blast

furnace slag will increase 1.3-fold; electrothermal phosphorous slag -- 1.4-fold; ash and ash-slag waste -- 1.9-fold; and wood scrap -- by 7 percent. The 1985 plan cals for the use of 50 types of the most important secondary material resources, the volume of processing of which will reach 47 million tons compared with 20 million tons last year. It is planned to increase the

production of products with the use of secondary raw materials to 386 million rubles, which is 134 million rubles more than last year's volume.

/Work will be continued on the further improvement of management and management techniques, on amplifying their impact on increasing the effectiveness of production/. Ministries and departments of republic subordination are planning the establishment of 10 production associations and 1 science-production association. Thirty new specialized shops and production facilities will make it possible to raise the level of branch specialization and concentration of production.

The team form of labor organization and work incentives, especially the team contract in agriculture which in 1985 will cover 528,000 sovkhoz workers belonging to the republic Minsel'khoz, will undergo wide development.

The plan for 1985 calls for the /further development of the productive forces in all republic oblasts and territorial production complexes/.

It devotes special attention to the Pavlodar-Ekibastuz Territorial Production Complex in which the construction of a second thermal electric power plant with a capacity of four million kilowatts and the Vostochnyy mine will continue on the basis of the intensive development of the Ekibastuz deposit of inexpensive energy-producing coal, the production of which will amount to 78,000 tons. The region's production of bulldozers and other products is on the rise. A large-scale program for the construction of housing, schools and other sociocultural facilities will be carried out.

The rate of development of industry in Chimkent Oblast is gaining momentum. Its yellow phosphorus production will grow by 10.6 percent; it is commencing the primary refining of oil.

Karaganda Oblast will continue to specialize in the production of coal, ferrous metallurgy products, cement, synthetic rubber, and many other types of producer and consumer goods. It will produce 49 million tons of coal, 5.7 million tons of steel and 4.3 million tons of rolled ferrous metals.

Dzhambul Oblast's further developmennt will for the most part be in the form of the accelerated development of the chemical and food industgry and agricultural production. The oblast's yellow phosphorous production will increase by 10.9 percent; mineral fertilizer production will reach 307,400 tons.

Tselinograd Oblast will play a leading role not only in the production of valuable varieties of wheat, but also in agricultural machine building and especially erosion control equipment.

Our republic, like the nation as a whole, has launched a socialist competition for completing the 11th Five-Year Plan with high labor indicators. It is important not only to provide material support for the fulfillment of obligations by every working collective. It is no less important to launch a broad propaganda effort and to explain the need for the unconditional fulfillment of the concluding year of the 11th Five-Year Plan. It must be remembered that the present economic year is in a manner of speaking the basis of the 12th Five-Year Plan which will bring about radical qualitative change in the social production of the republic and the nation.

Uzbek Plan Targets

Tashkent EKONOMIKA I ZHIZN' in Russian No 1, Jan 85 pp 2-10

[Article by K. Akhmedov, deputy chairman, UzSSR Council of Ministers; chairman, UzSSR Gosplan]

[Text] Our country has entered the final year of the 11th Five-Year Plan, the year of preparation for the 27th CPSU Congress. In his speech at the Politburo of the CPSU Central Committee, Comrade K. U. Chernenko, general secretary, CPSU Central Committee; chairman, Presidium, USSR Supreme Soviet, analyzed in depth the state of affairs in economic construction and posed specific targets for consolidating and strengthening the progress that has been made in improving the work and in accelerating economic growth.

The working people of the Uzbek SSR, like all Soviet people, warmly approve and support the party's domestic and foreign policy which consistently enhances our society's progress in building communism and steadily raises the people's living standard.

In 1985 our republic is faced with important tasks that were described in detail at the 16th Plenum and subsequent plenums of the Uzbek CP Central Committee; the efforts of party, Soviet and economic organs, of all republic workers are concentrated on their realization.

The State Plan for the Economic and Social Development of the Uzbek SSR in 1985 is aimed at the successful realization of these tasks. It was drafted on the basis of the targets of the five-year plan and promotes the implementation of the decisions of the 26th CPSU Congress and the 20th Uzbek CP Congress.

Owing to the great measure of assistance provided by the CPSU Central Committee and the Soviet government and the everyday work of the Uzbek CP Central Committee and party and Soviet organs at the local level, the working people of the republic, having launched broad socialist competition in honor of the 60th anniversary of the Uzbek SSR and the Communist Party of Uzbekistan, have made positive strides in the development of the productive forces and in increasing the effectiveness of production.

The measures taken have substantially improved the utilization of capacities in industry and have raised the output-capital ratio of existing enterprises compared with last year. Material inputs per ruble's worth of output have been reduced considerably.

Qualitative changes have been made in cotton farming and in other branches of agriculture and animal husbandry. For the first time in recent years, the yield of cotton fiber has substantially exceeded the planned level.

The effectiveness of investment in capital construction has increased. The share of construction in progress has been reduced as a result of the concentration of resources and capacities on the most important construction projects. The condemned practice of unplanned construction has been virtually eliminated.

The strengthening of state, plan and labor discipline and the elimination of previous negative phenomena and violations of socialist economic norms have been the most important national economic result of the decisions of the 16th Plenum of the Uzbek CP Central Committee. Proper order is being established in financial activity and in the system of accounting and accountability. All this has promoted the further progressive development of the republic's economy and improvements in the population's standard of living.

The results of economic growth are expressed in concentrated form in higher national income. This year, its volume will grow by 5.1 percent and will total 19.2 billion rubles. Four-fifths of this sum will be used to improve the people's well-being.

It is expected that the plan for the development of industry, whose output will be in excess of 21.2 billion rubles, will be overfulfilled. Industry's branch structure has been substantially improved as a result of the accelerated development of technologically progressive branches.

Branches associated with the production of consumer goods have developed at a relatively more rapid rate. Their output for the year has grown by almost a half billion rubles or by 5.4 percent; in the 4-year period as a whole, consumer goods production in excess of the target will total 1,347,000,000 rubles.

Workers in the countryside overcame the aftermath of adverse weather conditions and produced a good harvest. Gross agricultural output will be 7.4 billion rubles or 1.2 percent higher than in 1983.

Working under trying conditions, cotton farmers produced and sold to the state approximately 5,300,000 tons of cotton. Workers in Fergana, Tashkent, Namangan and Andizhan oblasts, in 53 rayons and on hundreds of farms, who fulfilled and overfulfilled plans and socialist pledges, are exemplars of heroic labor. The thin-fiber cotton procurement plan was surpassed: 440,000 tons were sold to the state.

Grain farmers in Andizhan, Namangan, Surkhan-Darya and Tashkent oblasts scored significant successes and fulfilled their grain sales plans. Rice growers in the Karakalpak ASSR and Khorezm Oblast performed well last year.

Plans for the purchase of vegetables, melons, potatoes, cocoons, wool, and karakul fur were fulfilled and overfulfilled. As a result, it was possible to make deliveries to the all-union fund considerably ahead of schedule: 1,100,000 tons of vegetables, melons, fruit and grapes were shipped to the working people of fraternal union republics.

Kolkhozes and sovkhozes undertook fall and winter work and the wintering of the livestock in an organized manner. Measures are being taken to preserve the livestock and to make it more productive.

The investment in the development of all branches of the economy in 1984 was 7.1 billion rubles. Fixed capital valued at 6.8 billion rubles (13 percent more than last year) will be put into operation.

The program for social development is being consistently implemented. Per capita real income will grow by 2.7 percent. Retail trade will increase by 5.2 percent; the volume of consumer services will increase by 8.9 percent. General housing space will be increased by 6.8 million m^2; schools with 132,000 [pupil] places, preschool institutions with 44,400 places and many health care, cultural and consumer service facilities will be put into operation.

The second line of the Tashkent Subway System -- from the Navoi Station to the Tashkent Station -- will become operational.

Work performed in 1984 decisively promoted economic growth in general during 4 years of the five-year plan. During this period, the gross social product increased by 18.8 percent and will exceed 40.6 billion while national income will grow by 18.8 percent.

The republic's labor collectives under the leadership of party organizations, having drawn the correct conclusions from the decisions of the 16th Plenum of the Uzbek CP Central Committee, have actively restructured their work and have achieved significant results in fulfilling their plans and in improving their production indicators.

At the same time, some branches of the national economy are still faced with numerous shortcomings, unresolved problems and unutilized reserves and are failing to fulfill their plans. The heads of some ministries, departments and executive committees of local Soviets, instead of bringing about radical improvement in the state of affairs, continue to offer various justifications for the nonfulfillment of production targets and try to have the plans adjusted downward.

The lag of individual enterprises and entire branches is a tangible manifestation of such a practice. As a result, the growth rate in industry for the elapsed period in the year was only 3.1 percent instead of the 5.4 percent indicated in the plan for the year. More than 200 enterprises failed

to fulfill their plan. One-third of all enterprises failed to deliver an aggregate 460 million rubles' worth of products in violation of contractual agreements. This was primarily the fault of Uzglavkhlopkoprom [Main Administration for the Uzbek Cotton Industry], Minstroymaterialy [Ministry of the Construction Materials Industry], Minplodoovoshchkhoz [Ministry of Fruit and Vegetable Industry], Minpishcheprom [Ministry of the Food Industry], Minstroy [Ministry of Construction], and certain others. The heads of these ministries -- comrades A. A. Urkinbayev, N. D. Urunov, R. A. Abdullayev, M. Yu. Yuldashev, and F. G. Poturemskiy -- did not take the proper measures to secure the unconditional fulfillment of their plans.

The better utilization of production capacities is a major reserve for accelerating [growth] rates. Facilities for producing building materials, phosphate fertilizers, cotton textiles, detergents, vegetable oil, rugs, etc., are operating at only 60-75 percent of capacity. If the 22 major ministries were working at full capacity, it would be possible to produce almost 700 million rubles' worth of additional products.

A number of ministries are remiss in addressing the problem of raising the technical level of production and the reconstruction and expansion of enterprises, which is frequently cited as the reason for failure to fulfill the plan. This is how matters stand in the Ministry of Construction Materials in which the shortfall in deliveries was as follows: cement -- over 1 million tons; brick -- 822 million units; slate tiles -- 53 million; glass -- 2 million m^2. As the result, the growth of production during these years was 21.5 percent compared with the 22 percent specified in the five-year plan.

Comrade Minister G. G. Isayev attributes this gap to the shortage of capital investments even though the ministry in 4 years was allocated more than 178 million rubles, which was 1.7-fold more than specified in the five-year plan. However it did not utilize approximately 11 million rubles of these investments. The same situation exists an a number of enterprises belonging to Minmebel'prom [Ministry of the Furniture Industry], Minbyt [Ministry of Consumer Services], and the republic's construction industry.

There are also substantial shortcomings in agriculture. Notwithstanding the existence of every possibility, the fulfillment of cotton procurement plans in Kashka Darya, Bukhara, Navoy and Dzhizak oblasts has been unsatisfactory as a result of serious omissions in the development of cotton farming. If these oblasts were to attain at least the average republic level, they would supply an additional 400,000-450,000 tons.

As a result of the slackening of attention on the part of Minsel'khoz [Ministry of Agriculture], Glavsredazirsovkhozstroy [Main Administration for Sovkhoz Construction in Central Asia] and Goskomsel'khoztekhnika [State Committee for Supply of Production Equipment for Agriculture], in recent years there has been a sharp decline in the level of total mechanization of cotton farming and especially mechanized cotton harvesting, particularly in Bukhara Oblast where the mechanized harvesting plan was fulfilled by only 6 percent and in Kashka Darya and Namangan oblasts, where the plan was fulfilled by 22 percent. The entire republic mechanized harvest plan was fulfilled by 43.7 percent.

The extremely low yields of farm crops are associated with the low effectiveness of utilization of irrigated land. Thus while output in Tashkent and Samarkand oblasts is 2600 rubles per hectare of irrigated land, in neighboring Dzhizak and Syr-Darya oblasts, the corresponding figure is 1200-1400 rubles. These indicators are also extremely low in the Karakalpak ASSR and in Kashka Darya Oblast.

As a result of the low effectiveness of new land and and the failure to bring it up to projected yield levels alone, the shortfall was 200,000 tons of cotton in the 4-year period. What is more, as a result of the unsatisfactory condition of over 600,000 hectares of old cultivated land in the Karakalpak ASSR and in Bukhara, Kashka Darya and Syr-Darya oblasts the annual shortfall in the cotton harvest is 350,000-400,000 tons.

In the light of the demands of the 18th Plenum of the Uzbek CP Central Committee, Glavsredazirsovkhozstroy (Comrade N. R. Khamrayev), comrade ministers I. Kh. Dzhurabekov, T. B. Baymirov and A. A. Urkinbayev, and the leaders of executive committees of local Soviets must carry out comprehensive measures to increase the return on irrigated land, to bring about a sharp increase in the production of cotton and other agricultural products.

A critical condition has developed with respect to the fulfillment of production plans and plans for the purchase of livestock products primarily due to the unjustified lowering of these indicators in Kashka Darya, Bukhara, Dzhizak and Samarkand oblasts and the Karakalpak ASSR (meat and milk) and in Kashka Darya, Dzhizak and Samarkand oblasts (eggs). The level of utilization of capacities of poultry factories and livestock complexes is declining from year to year. Compared with 1975, the utilization of poultry meat producing capacities of Goskomptitseprom [State Committee for the Poultry Industry] declined from 81 to 61 percent and the utilization of egg producing capacities dropped from 94 to 72 percent. In Uzglavzagotzhivprom [UzSSR Main Administration for the Livestock Procurement Industry], feedlot indicators declined even more: from 76 to 56 percent.

For this reason alone, the republic experience an annual shortfall of up to 40,000 tons of meat and 300 million eggs. This situation is the result of serious shortcomings in the structure of publicly owned livestock, breeding and the development of the feed base. Suffice it to say that if the share of cows in the republic's publicly owned livestock were raised to the level of Tashkent Oblast, the result would be 140,000 additional tons of milk and 42,000 more calves.

Agriculture in Kashka Darya Oblast suffers from substantial shortcomings in its development. As a result of insufficient attention to the effective use of the enormous sums invested by the state in the development of this oblast, the oblast cotton procurement plan was fulfilled by 55 percent and average cotton yield was only 15 centners per hectare. The oblast failed to fulfill its purchase plans for all types of agricultural and animal husbandry products. At the same time, Comrade T. S. Sakhatov, chairmann of the oblispolkom, and other oblast leaders, instead of critically appraising the shortcomings and taking corrective measures, continue to press for the lowering of plan targets.

Progress in improving the state of affairs in construction is slow. During the elapsed period of the year, more than 370 million rubles in capital investments were not utilized and the year plan for the activation of capital was fulfilled only by one-half. The construction of a number of priority projects is proceeding at a slow pace, resources are being scattered and estimated costs are rising, particularly in the case of construction projects belonging to Mintsvetmet [Ministry of Nonferrous Metallurgy], Minudobreniy [Ministry of the Fertilizer Industry], Minlegprom [Ministry of Light Industry], and Mingaz [Ministry of the Gas Industry].

There is a substantial lag in the activation of housing, preschool institutions, and hospitals, especially those that are subordinate to Minvuz [Ministry of Higher and Secondary Specialized Education], Minpishcheprom, and the Dzhizak, Syr-Darya and Kashka Darya oblispolkoms.

Increased employment of growing labor resources, the staffing of newly activated enterprises with skilled personnel, improvements in the utilization of capacities on this basis, and the raising of the shift coefficient are a major reserve for the growth of effectiveness. As is known, while the general availability of manpower in the republic is high, a large number of enterprises and entire branches -- construction materials, machine building, light industry, construction -- and individual branches of agriculture experience an acute manpower shortage.

As a result of insufficient attention on the part of Gosprofobr [State Committee for Vocational and Technical Education], ministries and departments, the network of vocational-technical training schools is growing slowly. Funds allocated by the state for these purposes are not being properly utilized: during 4 years [of the five-year plan period], 37 million rubles or 30 percent of these allocations have not been utilized; this underutilization is 70 percent in Glavsredazirsovkhozstroy and over 60 percent in Minsel'khoz. Training schools with more than 5000 places should have been put into operation. As a result, only one-fifth of the workers entering the industrial work force and 30 percent of the new workers in construction are graduates of vocational-technical training schools.

There are also certain shortcomings and unutilized reserves in transport and communications, in trade and consumer services.

Ministries, departments and executive committees of local Soviets must strive to see to it that every enterprise, building site and farm uses its potential to secure the unconditional fulfillment of the targets and socialist pledges for the current year.

According to Comrade K. U. Chernenko's precise definition, 1985 must be the year of mobilization of all manpower for the successful completion of the present five-year plan and the year in which a good and firm basis is established for the 12th Five-Year Plan.

In full accordance with the decisions of the 16th Plenum of the Uzbek CP Communist Party, plan indicators ensure the further improvement of the well-

being of the republic's population on the basis of dynamic development, the increased effectiveness of production and the attainment of high final national economic results. Accordingly, the primary emphasis is placed on the realization of the following tasks:

-- the acceleration of growth rates and absolute increases in social production; increasing the effectiveness of production on the basis of the all-round intensification and growth of labor productivity and as a result, the further improvement of the population's living standard;

-- the further development of the cotton complex as the most important direction of the republic's all-union specialization; the implementation of integrated measures to fulfill the Food Program;

-- the acceleration of social development; the more complete satisfaction of the population's growing need for goods and services; the accelerated construction of housing; the development of education, culture, health care, and the service sphere;

-- securing the increased effectiveness of capital investments; the assignment of top priority to their use for reconstruction and for the technical retooling of production; the accelerated activation of capacities and facilities coupled with the improvement of the quality of construction; and the curtailment of the volume of construction in progress;

-- the improved use of raw materials, supplies, labor and financial resources; the intensification of the economy program in production and in the service sphere.

The increased effectiveness of production, primarily as a result of the increase in the return on the production potential and intensive factors is a most important feature of the plan. This was expressed in the relatively more rapid growth of national income compared with the gross product: produced national income will increase by 5.4 percent and will total 20.2 billion rubles; the gross social product will increase by 5 percent and will total 42.7 billion rubles.

In industry, 88.5 percent of the total increase in output (1.5 billion rubles) will be the result of intensive factors -- primarily as a result of the increased yield from existing capacities -- and only 11.5 percent will be the result of the construction of new enterprises. Labor productivity in industry will grow by 3.4 percent; in agriculture and construction -- by 3.5 percent; this will account for 80 percent of the increase in industrial output at existing enterprises and for the entire increase in construction and installation work.

Special attention is devoted to the acceleration of scientific-technical progress. Fifty-five research efforts [nauchnyye razrabotki] and 458 new technology measures will be incorporated in production. The plan calls for the total mechanization of 190 shops and sectors, the installation of 157 mechanized and automated lines, the introduction of 135 units of robot technology, and the expanded application of solar energy and wastefree

technology. Powder metallurgy will undergo further development; 30 enterprises belonging to 19 ministries and departments will use this technique to manufacture and recondition parts.

The projected increase in the effectiveness of production is reinforced by measures to improve product quality. Over 80 products will be certified in the highest category and by the end of 1985 their total number will reach the 700 mark. The share of products bearing the Quality Emblem in the total number of products to be certified will be 54.6 percent. In line with the aims of the Uzbek CP Central Committee, the target is to raise the share of products in the highest quality category in total output volume to 13.3 percent and in the volume of products to be certified -- to 60.8 percent.

Based on increased effectiveness and improved quality, profit is planned to increase by 13.2 percent and costs are planned to decline by 0.8 percent in industry and by 0.6 percent in consumer services. Work to improve the quality of mangement of the economy will be continued.

The leading role in the development of the national economy is played by industry whose output volume will grow by 6.7 percent, including production of the means of production (group 'A') -- by 6.6 percent and consumer goods -- (group 'B') -- by 6.9 percent. Work will be continued on improving the branch structure of industry. There will be an increase in the share of production of basic branches that are the agents of technical progress and labor-intensive branches that provide increased employment for rapidly growing labor resources.

Parameters of the fuel-energy complex have been developed in accordance with the USSR Energy Program. Electric power production will total 47.1 billion kilowatt-hours or 3.1 billion more than five-year plan targets. The extraction of coal, oil and gas and the volume of oil refining will grow.

New power-generating capacities totalling 570 megawatts will be activated. They will include new power units at the Angren GRES [state regional electric power plant] and the Mubarek TETs [heat and electric power plant] and the 5th section of the Takhiatash GRES. Work on the reconstruction of the Angren coal basin will be continued.

Production in /ferrous metallurgy/ will grow by 10.8 percent. Steel production will grow and rolled metal production will increase 1.7-fold. Enamelware production will increase by 11 percent compared with five-year plan targets and will total 51 million rubles in retail prices. More than 94 million rubles are allocated for the further development of /nonferrous metallurgy/. More zinc, copper, aluminum, hard alloys, and other products will be produced.

As in years past, the /chemical and petrochemical industry/, with a growth rate of 18.6 percent, will develop rapidly. Mineral fertilizer production is scheduled to grow by 35 percent and to total almost two million tons. More chemical fibers, defoliants, sulfuric acid, detergents, and other products will be produced.

The Samarkand Chemical [Plant] will be expanded; new facilities will be built at the Navoy Electrochemical Plant, at the Almalyk Chemical Plant, and in the Chirchik Elektrokhimprom Association.

/Machine building and metalworking/ output will increase by 5.7 percent, including a 6.6 percent increase in machine building output. Tractor production will increase by 300 units; agricultural machinery -- by five percent. Substantially more electrical and production equipment will be produced for various branches of industry.

The Tashkent Motor Plant will for the first time assemble a large number of high powered tractor engines; the Uzbekkhimmash Plant will produce new models of equipment. The production of home tape recorders will commence.

The growth of /production of construction materials/ scheduled for the coming year is balanced with the capital construction program and will total 4.1 percent. The production of cement will be increased by 5.9 percent; wall-building materials -- by 11.4 percent; prefabricated reinforced concrete -- by 9.7 percent; porous fillers -- by 10.6 percent, etc.

The question of increasing the production of /consumer goods/ has received special attention in line with the party's policy of securing the ever more complete satisfaction of the growing needs of the population. Their production in retail prices will total 9,617,000,000 rubles, which will make it possible to raise per capita consumption to 524 rubles compared with 515 rubles in 1984; computed in terms of the wage fund -- to 123.5 kopecks compared with 120.8 kopecks in the current year.

All industrial enterprises are drawn into the production of consumer goods; provision is made for making more complete use of local and secondary raw materials in the process. Measures are indicated for improving product quality, for updating and expanding the mix of products for children and products that are in everyday demand.

The leading role in increasing consumer goods is assigned to light industry in which their production will grow by 6.4 percent. The production of cotton textiles will increase by almost 50 million m^2 for a total 377 million m^2. The production of silk textiles will increase by 8.6 million m^2 (for a total 144.6 million m^2); hosiery -- by 32.5 percent; knitted undergarments -- by 16.3 percent, etc. Between 60 and 70 percent of the light industry product mix will be updated in 1985.

Six affiliates of textile enterprises, five sewing and knitwear enterprises and two footwear enterprises are scheduled to be put into operation in small towns and rural rayon centers. The second finishing complex of the Bukhara Textile Combine will turn out its first products. Construction of the Andizhan Cotton Combine and a number of other branch enterprises in the Karakalpak ASSR, Dzhizak and other republic oblasts will continue.

Production volume of the /Uzbek SSR Minmebel'prom/ [Ministry of the Furniture Industry] will increase by 5.2 percent; republic furniture production will increase by 6.5 percent.

allocation of mineral fertilizers (calculated in terms of 100 percent nutrient content) will be 1,130,000 tons or 130,500 tons more than in 1984.

The development of indicators of the processing branches of the APK [agroindustrial complex] has been coordinated with agricultural production. In the coming year, the /cotton cleaning industry/ will operate under new conditions: as is known, starting with the present year, the acceptance and payment for cotton will be based on the quality and content of the fiber. With the stabilization of cotton production at the level of the 1984 plan, there will be considerable increase in the fiber yield.

The improvement in the quality of cotton processing is reinforced by the strengthening of the material-technical base of the cotton cleaning industry. Scheduled construction projects include: a gin in the settlement of Shumanay (Karakalpak ASSR); 2 new procurement centers; 28 drying and cleaning shops; 70 laboratories; 2 nonwoven materials shops, etc.

Gross output in the /food industry/ will increase by 6.1 percent for the year, including a 6.6 percent increase in Minpishcheprom [Ministry of the Food Industry], a 2 percent increase in Minmyasomolprom [Ministry of the Meat and Dairy Industry],a 9.8 percent increase in Minplodoovoshchkhoz [Ministry of the Fruit and Vegetable Industry], and a 7.8 percent increase in Gosrybkhoz [State Committee for the Fish Industry]. There will be a considerable increase in the production of vegetable oil; whole-milk, fish and confectionery products; tea; meat and sausage products; refreshing beverages, mineral water and beer.

New capacities will be activated for the production of 60 million cans of fruit and vegetables, for packaging 7200 tons of tea as well as for the production of beer, confectionery and bakery goods. The plan calls for the construction of a dairy plant in Shakhrikhan, a meat combine in Dzhizak, and for the activation of ponds on fish farms over an area of more than 200 hectares.

Production in the /flourmilling and groat industry/ is scheduled to grow by 5.7 percent. Mixed feed production will exceed the five-year plan targets.

The draft plan envisages the further development of transport. The overall volume of trucking will grow by five percent. The network of motor roads will grow by 260 kilometers and will total 32,500 kilometers. Rail transport and civil aviation will undergo further development.

The volume of /communications/ will increase by 5 percent and will total 265 million rubles. The capacity of urban telephone stations will be increased by 80,000 and the capacity of rural telephone stations will be increased by 38,000 numbers.

The development of all branches of the economy depends in decisive measure on the volume and effectiveness of capital construction. /Capital investments/ from all sources of financing in the republic will total 6,818,000,000 rubles or 6 percent more than the five-year plan targets. The state's share will be 5,935,000,000 rubles, of which 77 percent will be channeled into the construction of productive facilities.

The allocation for the development of the fuel-energy complex and machine building will be greater than the amount indicated in the five-year plan. Investments in ferrous and nonferrous metallurgy and in the light, food, meat-dairy, and fish branches will be higher than in the current year. The allocation for the development of the entire agricultural complex will be 2,816,000,000 rubles or 41 percent of total capital investment.
Republic construction organizations will continue national economic construction projects in Tyumen Oblast and in the BAM [Baikal-Amur Mainline] zone.

In the interest of increasing the concentration of funding of priority projects, 74 percent of all capital investments will be earmarked for carry-over construction compared with 67 percent in 1984. The volume of construction in progress will be reduced from 64 percent in 1983 to 61 percent, including a reduction to 58 percent in the republic economy, which is in conformity with the established norm.

Basic attention is focused on the uniform activation of projects and fixed capital. There will be a considerable increase in the share of first quarters in the volume of annual activation particularly with regard to housing, schools, preschool institutions, health care, and certain other facilities.

The growth of the volume of contractor activity and the strengthening of the material-technical base of construction organizations are planned in accordance with the volume of capital investments and construction-installation work.

The draft plan reflects questions pertaining to the expansion of the national economy's mineral and raw material base. The planned volume of /geological prospecting work/ will support the five-year plan growth target for reserves of the most important minerals: lead and zinc, phosphorites, oil and gas. The allocation for exploratory-prospecting activity is 167,400,000 rubles. Another 50.5 million rubles in capital investments are scheduled for deep exploratory drilling for oil and gas.

The plan assigns a prominent place to measures for the /protection and rational utilization of natural resources/. The respective allocation is 85 million rubles -- 6 million more than in 1984 and 7 percent more than the five-year plan target.

In full accordance with party program principles relating to the further /raising of the living standard and cultural level of the people/, special attention has been devoted to questions of social development. The republic population's money incomes will grow by 653 million rubles or by 3.8 percent compared with the level anticipated for 1984 and will total 17.9 billion rubles. Social consumption funds are planned to grow by 5.2 percent.

/Retail trade/ for 1985 is estimated at 14,360,000,000 rubles, including the additional target of 350,000,000 rubles. This is 6.8 percent higher than the expectation for the current year. There will be a substantial increase in the sale and per capita consumption of meat and dairy products, eggs, fish, and

vegetables. Commodity stocks of the most important industrial commodities -- fabrics, footwear, furniture, utensils, vehicles, etc. -- will be increased. The volume of /sales of consumer services/ to the population will be increased by 11.4 percent.

A large volume of /housing construction/ will be carried out in 1985. The plan calls for the activation of more than 6.3 million m^2 of housing from all sources [of financing], which is 148,000 m^2 more than the five-year plan target. The volume of housing and cooperative construction will grow 1.5 fold and the scale of private home construction will grow substantially.

More than 155 million rubles are allocated for the development of /municipal services/, thereby making it possible to improve the water supply to the population of the Karakalpak ASSR and oblasts significantly, to increase the capacity of heating and sewer networks, and to raise the use level of natural gas in the home.

Construction of the second line of the Tashkent Subway from the railroad station to the Chkalovskayha Station will continue. Work will commence on the section of track between the Navoi Station and the Beruni Station.

Indicators of development of /public education/ have been developed on the basis of the decisions of the April (1984) Plenum of the CPSU Central Committee on the reform of the general education and vocational school. Enrollment in daytime general education schools will grow by 2.6 percent and will total 4,251,000 pupils. Preschool institutions will accommodate 45.8 percent of the preschool population compared with 42.1 percent in 1984.

The plan calls for the admission of 3900 more students to VUZ's and secondary specialized educational institutions, for the graduation of 5400 more specialists and for a total enrollment of 128,800 students. The training of skilled workers in vocational-technical training schools and on the job will grow by 3.5 percent and will total 429,500.

Indicators of development of culture, physical culture, sport, and social security surpass the five-year plan targets. There will be an increase of 9000 hospital beds in the /health care system/, which will be 4.2 percent of the 1984 level. The ratio of hospital beds to population will thus be raised to 120:10,000, which corresponds to the five-year plan target.

In fulfillment of program decisions of the Uzbek CP Central Committee and the republic government on the /location of the productive forces/, the comprehensive development of the economy of the Karakalpak ASSR, oblasts and rayons will continue on the basis of the more complete utilization of natural and economic conditions and a higher degree of integration and specialization. Special attention is devoted to the accelerated development of newly organized and virgin regions and labor-intensive branches and to improving the use of growing labor resources. Enterprises, their affiliates and shops will continue to be sited in small towns and rural areas.

The plan allocates /material-technical resources/ and provides for /contractor-performed work/ in a volume that will ensure the fulfillment of

the development targets for all branches of the economy. Targets are set for conserving fuel-energy resources, including electric power -- by five percent; thermal energy -- by six percent; and petroleum products -- by four percent.

The development of production provides a reliable basis for the further expansion of foreign economic relations. Republic enterprises deliver their products to 75 countries of the world. In 1985 exports will grow by five percent. The volume of commodity exchange operations with foreign countries will increase by 70 percent. The training of cadres for the developing countries in Uzbekistan's educational institutions will continue to develop. Aid in water management and agricultural construction projects and in mineral prospecting will continue.

As the foregoing shows, the high growth rates of leading branches indicated in the draft plan will for the most part ensure the fulfillment of targets and basic directions approved by the 26th CPSU Congress for the Uzbek SSR under the 11th Five-Year Plan.

At the same time, for a number of reasons -- particularly, as a result of the failure to activate capacities on schedule and the adverse weather conditions of recent years -- it has not been possible to meet the five-year plan targets for some items. Total industrial growth for the five-year period will be 128.6 percent instead of 129 percent primarily as a result of lagging enterprises in ferrous and nonferrous metallurgy, the coal industry, the petrochemical industry, the Ministry of Machine Building for Light and Food Industry and Household Appliances, Ministry of Tractor and Agricultural Machine Building, Ministry of the Electrical Equipment Industry, UzSSR Main Administration for the Cotton Industry, Ministry of the Food Industry, Ministry of the Furniture Industry, Ministry of the Fruit and Vegetable Industry, Ministry of Local Industry, and some others.

In the process of communicating plan targets to enterprises and organizations, it is essential to examine the potential for the maximum utilization of existing and newly activated capacities, for the growth of labor productivity, and for reliable material-technical support. If the measures that are taken raise the output-capital ratio by just 1 kopeck for every ruble of productive capital, it will mean 180 million rubles in additional output and will make it possible to reach the level of the five-year plan target.

The growth of gross output in agriculture is planned at the level of 116.2 percent compared with 117 percent under the five-year plan. In the light of the decisions of the October (1984) Plenum of the CPSU Central Commititee and the 18th Plenum of the Uzbek CP Central Committee, in order to meet the five-year plan target, it will be necessary to bring about a dramatic increase in the return on irrigated land and to make effective use of capital investments and material resources allocated for the development of the agroindustrial complex.

In capital construction, it will be necessary to overcome the lag of previous years in the activation of production facilities, housing, other facilities in the nonproductive sphere and the consumer service sphere and to prevent the practice of unplanned construction in the future.

Vast unutilized reserves for improving the work exist in public transport, consumer services, and other branches.

The more effective utilization of resources is a common task that must permeate the work of all labor collectives. During the elapsed years of the five-year plan, there has been considerable overexpenditure of materials, fuel and electric power by the Ministry of Agriculture, the Ministry of Land Reclamation and Water Resources, the Main Administration for Construction in Tashkent, Goskomsel'khoztekhnika, and a number of other ministries and departments.

As emphasized at a sitting of the Politburo of the CPSU Central Committee, the example of the country's leading collectives should be followed and the effort should be organized in such a way as to permit operation for at least 2 days in 1985 on the basis of economized supplies, raw materials and fuel.

Improvement of economic and financial work in branches and labor collectives is an important general economic task. Much has been done in this direction of late. However, as a result of the nonfulfillment of the established plans, the slackening of oversight over the observance of plan discipline, and insufficient attention to the introduction of cost accounting, economic results at some enterprises and on some farms continue to be low and their financial status remains unsatisfactory. Wages are permitted to outstrip labor productivity, working capital is diverted, profit and profitability plans are not fulfilled, and work is unprofitable.

On the basis of the consistent introduction of cost accounting; the strengthening of state, plan and contract discipline; the development of economic experimentation and creative initiative, the leadership of ministries, departments and economic units must strive not only for the unconditional fulfillment of plans but also for maximum economic and financial results.

For all the intensiveness of the plan's indicators, the vast reserves and potential of the republic's economy show that the plan is without question realizable. In the words of Comrade K. U. Chernenko, "the task of organizing a precise, purposeful effort to implement all our plans is now advanced to the forefront. The question is posed as follows: the plan must be unconditionally fulfilled and where possible and necessary -- overfulfilled."

In the process of drafting and adopting counterplans and socialist pledges, ministries, departments, local Soviets of People's Deputies, enterprises and organizations should accordingly bring all indicators up to the level of the five-year plan.

The strengthening of state and plan discipline; rhythmic, highly productive work from the first days of the new year in every labor collective and every workplace; the broad development of socialist competition; and the active introduction of progressive know-how are a most important prerequisite to the realization of the tasks that lie ahead.

Republic workers without a doubt will fulfill the decisions of the 16th and subsequent plenums of the Uzbek CP Central Committee, will fulfill the 1985 plan and all targets of the 11th Five-Year Plan and will provide a worthly greeting for the 27th CPSU Congress.

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REGIONAL DEVELOPMENT

GEORGIAN GOSPLAN OFFICIAL ON ECONOMIC EXPERIMENT IN REPUBLIC

Tbilisi ZARYA VOSTOKA in Russian 26 Feb 85 p 2

[Article by Amiray Gabisoniya, Georgian SSR Gosplan department head, honored economist of the republic]

> [Text] Exceptionally great significance is attached to the large-scale economic experiment which the country is currently carrying out on expanding the rights of production associations and enterprises in planning and economic activities and on increasing their responsibility for the end results of work.

In his election campaign speech Comrade K. U. Chernenko noted that "the need for qualitative changes in our economic work is widely--one can say universally--recognized. It is now essential for these changes to be carried out more decisively. Everything useful and valuable which the economic experiments, as well as advanced forms and methods of economic management have already provided us must be put to use more boldly and without delay."

In 1984 16 of our republic's enterprises which come under the jurisdiction of the Ministry of Heavy and Transport Machine Building and the Ministry of the Electrical Equipment Industry were involved in the large-scale economic experiment. Beginning in 1985 they have been joined by 12 more industries, which come under the Ministry of the Machine Tool and Tool Building Industry, the Ministry of Tractor and Agricultural Machine Building and the Ministry of Instrument Making, Automation Equipment and Control Systems. At present the industrial output of these 28 production associations and enterprises is approaching 5 percent of the republic's total industrial production, and they account for more than 9 percent of all the republic's industrial employees. The enterprises and associations which operate under conditions of the large-scale economic experiment, as opposed to the conditions of the 1965 economic reform and the new economic mechanism of 1979, have obtained incomparably broader rights in the utilization of their own production income.

Under the new conditions the labor collectives of these associations and enterprises can make better use of the following: planned and above-plan profits; the planned wage fund; savings on wages; economic incentive funds; financial means for capital construction and renovation, for the construction of production facilities, and especially for the production of social infrastructure facilities. They have been granted the right to establish a management structure which is efficient for them; to establish new, higher salary scales and wage rates for manual workers and other employees who have distinguished themselves; to establish various incentive funds using means obtained from the sale of consumer goods and from above-plan reductions in production costs; as well as other rights and benefits.

Along with these rights, the production collectives which operate under the new conditions are entrusted with a serious responsibility for the results of their work, for the fulfillment of state targets and for the effective utilization of the material valuables and resources allotted to them. The main features of this responsibility amount to the following: the sale of output on the basis of supply contracts is becoming the main criterion of their work. If the work declines and the supply contracts are not fulfilled, the labor collectives lose the rights to the practical application of the large self-financing opportunities which have been granted.

This improved system of cost accounting is designed to ensure a better combination of the interests of the labor collectives with the interests of society as a whole and of the socialist state. For this reason there is no doubt that the further development--both in breadth and depth--of this large-scale economic experiment will be in the interests of socialist society.

The main results of the 1984 work of the republic's associations and enterprises carried out under conditions of the economic experiment are hopeful. We will cite some data. The enterprises participating in the experiment fulfilled by 99.9 percent the 1984 plan for the sale of output, with consideration for supply obligations, while the republic's industry in general achieved a figure of 98.8 percent, including 97.5 percent for industry under Union jurisdiction. They achieved 87.5 percent of the entire increase in industrial output (with a 77.2 percent the average for the republic) through growth in labor productivity. For these enterprises the 1984 plan for industrial output was 102.9 percent fulfilled, while the rate of growth amounted to 106.4 percent; these figures are significantly higher than the average indicators for the republic.

At the same time it must be noted that the large-scale industrial economic experiments, as a rule, are concerned with solving problems of an exclusively sectorial (industrial) nature, which

are unrelated either to problems of a geographical nature, or to problems related to the development of the nonproduction and social infrastructure, or the development of the area formations in which these enterprises and associations are located. And it is in this connection that we approach in a logical manner the question of regional experiments which supplement the large-scale sector experiments. We will attempt to touch on this question briefly.

It is well known that since 1981 our republic has been conducting economic experiments aimed at a better combination of sector and territorial principles in the planning and management of economic and social development. And the initiators of this experiment are also known to everyone: the Poti Gorkom of the Georgian Communist Party and the ispolkom of the Poti City Soviet of Peoples Deputies. At the present time the experience of the Poti residents has spread to the cities of Tbilisi, Kutaisi, Rustavi and Sukhumi. And a number of other cities in the republic are also getting ready to apply this experience. As is well known, this work is directed by the republic's special commision in charge of improving the economic mechanism, preparing and implementing economic experiments; this commission was established in March 1984 by the Central Committee of the Georgian Communist Party and the Georgian SSR Council of Ministers.

As is well known this work, which the republic is carrying out most intensively, was rated highly by the December (1983) decree of the CPSU Central Committee on the work of the Georgian Communist Party Central Committee on improving management systems, on improving economic work and on making rational use of resources.

The experiment which is being conducted in our republic has the aim of searching out in a practical manner the effective forms and methods for, so to speak, the materialization of the ispolkoms' rights, and for the practical implementation of those jurisdictional rights which are granted to the local soviets of peoples deputies by the USSR Constitution and by other legislative acts of the country.

Comrade K.U. Chernenko points to the necessity of this work in his article "Some Current Problems of the Theory, Strategy and Tactics of the CPSU": "We must overcome the well-known gap between the very rich opportunities of our democracy, and especially of our soviets, on the one hand, and their actual utilization on the other."

When they were looking for ways to realize the extensive rights which the soviets have, the republic's party organization came to the conclusion that it is essential--without increasing management personnel in the region--to create a definite organ of a

self-financing type, not a sector, but an inter-sector, territorial organ, and because only the ispolkom of the soviet of peoples deputies manages general regional interests, this organ had to be subordinated to it, that is, to the ispolkom. The essential core and key direction of this new organ lie in its self-financing basis, in its mutual relations of commercial partnership with enterprises and organizations located in the city, and in the maintenance--by workers--of their management apparatus using their own, rightfully earned means rather than funds from the enterprises and organizations. The formation of this organ resolves a special problem, which relates to the emergence in the city of a single master of the municipal economy, a master who is concerned with the development of the city's economy, with the city's production infrastructure, as well as its non-production and social infrastructure, a master who establishes commercial-partnership ties and business contacts among city enterprises which come under different sectorial departments.

It is true that the complex task described above, which is unique in its comprehensiveness, is being carried out but not all at once and not so smoothly; however, the work of the Poti, Tbilisi (which also has them at the rayon-level), Kutaisi, Rustavi and Sukhumi territorial inter-sector associations is aimed at achieving this strategic task. When they acquire the appropriate experience and practical operational skills and when various aspects of their multi-faceted work are even better organized, our regions will have functioning management organs which are unlike any others in the country at the present time.

But how do these experimental organs make contact with the enterprises and associations which are part of the large-scale economic experiment, what kind of links have been established with them, how have they been able to influence them? In accordance with the interim regulations concerning the territorial-inter-sector associations--which were worked out by the republic's commission in charge of improving the economic mechanism, preparing and implementing economic experiments--the enterprises, associations and organizations which are located within the area of the respective cities preserve their economic independence, their right of juridical person, and their previous subordination to their own ministry. At the same time they come under the territorial inter-sector association with regard to land usage, construction, the utilization of labor and local material resources, the production of consumer goods, the implementation of the city's food program, the development of the production and social infrastructure and the development of counter plans and cooperation in the management of material and financial resources for city-wide needs.

The territorial inter-sector association draw from enterprises and organizations 50 percent of the extra profits which they

obtain as a result of the production and sale of new, highly-effective output and output with the State Seal of Quality, 50 percent of the free surplus of above-plan profits and 10 percent of the profits which they obtain from the production and sale of consumer goods manufactured from production wastes.

These deductions are used to finance the renovation and construction of new production facilities and of municipal facilities to improve the socio-cultural, household and other services for the labor collectives and for the entire population of the city.

The territorial inter-sector associations utilize financial means to provide assistance to enterprises and organizations regardless of their departmental affiliation: the assistance is for the implementation of measures on specialization and cooperation in production; for the construction of sections, shops and other production units for the purpose of expanding the output of consumer goods; for the acquisition of means of transport, production machinery and equipment; for the expansion and completion of capital repairs to municipal facilities for education, health care, sports buildings and other cultural and service facilities. These funds are also used to provide prizes for employees of city enterprises and organizations who have carried out particularly important tasks which are of city-wide significance.

The territorial inter-sector association also extends to city enterprises and organizations encouragement and assistance in finding personnel, in stabilizing and balancing plan targets, in looking for internal resources and in making better use of them through the redistribution of unnecessary and superfluous material valuables (raw and secondary materials, equipment) among these enterprises and organizations.

Naturally the inter-sector territorial experimental organ, by demonstrating concern for the development of the city's non-production infrastructure and by providing inter-sector services to enterprises and organizations, contributes in a real way to the growth of the city's total economic potential and to its rational utilization; it improves the social and labor climate in the region, as well as the attitude of blue and white-collar workers to their production unit, and the attitude of those who enjoy all the other social and material benefits which effect the entire city. This aspect of the work of the new organs is extremely noteworthy because, in our opinion, it complements the large-scale economic experiment, which is subsequently turned into what can be called a territorial-sector large-scale comprehensive experiment.

Examples which confirm this can be cited. The Poti Territorial Inter-Sector Association has become deeply involved in the con-

struction of plantsto provide intersector manufacturing equipment under its own jurisdiction. The issue has also been resolved in a positive manner by the respective union ministries, which are alloting capital investments. The city is also seeing the emergence of a positive outcome to the problem of organizing consumer goods production at the Ship Building and Repair Plant imeni Ordzhonikidze.

"We need to put to use more boldly and without delay," Comrade K.U. Chernenko said in his campaign speech, "everything that is useful and valuable which the economic experiments, as well as advanced forms and methods of economic management have already provided us."

This economic experiment on combining in a better way the sector and territorial principles in the planning and management of a city's economic and social development is an innovation made by our republic. The experiment is only beginning to bear fruit. There is no doubt that in the near future, when it has received sufficient development, it will exert an ever increasing influence on the all-Union large-scale economic experiment, complementing and enriching it; at the same time it will constitute a legitimate, valuable and unified system for managing the social and economic processes both within a sector and within a region.

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REGIONAL DEVELOPMENT

CONFERENCE HIGHLIGHTS KARATAU-DZHAMBUL TPK DEVELOPMENT

Alma-Ata NARODNOYE KHOZYAYSTVO KAZAKHSTANA in Russian No 2, Feb 85 pp 8-13

/Article: "Long-Term Overall Development Program for the Karatau-Dzhambul TPK"/

/Text/ A regional scientific and practical conference "Problems of and Prospects for the Development of the Karatau-Dzhambul Territorial Production Complex" organized by the Dzhambul Oblast Party Committee, the Council for the Study of Productive Forces of Kazakhstan under the Presidium of the Kazakh SSR Academy of Sciences and the editorial board of the journal NARODNOYE KHOZYAYSTVO KAZAKHSTANA was held in Dzhambul.

More than 400 scientists in Moscow, Leningrad, Alma-Ata and Dzhambul and managers and specialists of Union and republic planning organs, ministries, departments, party and Soviet organs and production collectives took part in the work of this conference.

It is difficult to overestimate the importance of the development of the Karatau-Dzhambul TPK /Territorial Production Complex/. This was also reflected in the important point of the Basic Directions in the Economic and Social Development of the USSR for 1981-1985 and for the Period Until the Year 1990: "To put into operation capacities for the extraction of phosphorites in the Karatau Basin... for the production of yellow phosphorus and mineral fertilizers." Fulfilling the decisions of the 26th CPSU Congress, the workers of the complex increase their contribution to the realization of the country's Food Program.

During 4 years of the five-year plan capacities for the production of yellow phosphorus, phosphoric acid and sodium tripolyphosphate were put into operation at the Novodzhambul Phosphorus Plant and for phosphorite ore and fine phosphate raw materials, at the Karatau Production Association. The Khimprom Production Association is being reconstructed, departments for wet-process phosphoric acid and a fodder phosphate shop at the superphosphate plant are being modernized and the construction of a pellet factory at the Karatau Chemical Plant, of the Zhanatas Suspension Factory and of the Aksay Underground Mine has begun. The output of commodity phosphorite ore, yellow phosphorus, sulfuric acid and mineral fertilizers has increased significantly during this period.

Electric power engineering, machine building and metalworking enterprises, enterprises for the output of building materials, local industry and the agro-industrial complex were further developed in the TPK. As compared with 1980 the volume of gross output increased by one-third.

Opening the regional scientific and practical conference, T. Temirbekov, secretary of the Dzhambul Oblast Party Committee, drew the attention of its participants to the considerable difficulties, which arose in the process of formation of the TPK, in particular, in the use of the created economic potential, as well as to disproportions in the sectorial structure.

The most serious problems remain in the key sector of the TPK, that is, the chemical industry, where capacities for the production of yellow phosphorus and mineral fertilizers are not utilized fully.

The equipment of light industry enterprises is not loaded fully. The production of building materials, local and woodworking industries and agriculture are developing slowly.

The growth of capacities in the industrial sector of the TPK has led to an increase in the consumption of electric power and fuel. Their shortage is now felt here. Transport, especially railroad transport, requires a proportional development. The deficiency in water supply for the population of cities, the industry and agriculture and unsolved problems of environmental protection hamper the rates of growth of the TPK.

T. Temirbekov stressed that the work of the regional conference should be directed toward a discussion of all these production problems and a search for their efficient solution.

More than 40 lectures and scientific reports were presented at plenary and section meetings. They examined various aspects of the preparation of a long-term overall program for the formation of the TPK, including problems of development of productive forces and prospects for the strengthening of the raw material base of the phosphorite-bearing basin, efficient utilization of underground resources, intensification of chemical production, improvement in power and water supply, expansion of the agroindustrial complex and refinement of the social infrastructure.

This wide exchange of views, multilateral contacts by participants in the conference, their mutual consultations and discussions and familiarization with the production of a number of enterprises of the TPK contributed to a creative elaboration and to the adoption of detailed recommendations.

The recommendations of the regional scientific and practical conference calculated for a long-term period and the maximum effect will be taken into consideration during the preparation of the long-term overall program for development. This document will become the basis for the large-scale measures directed toward an all-around improvement in all the sectors of the TPK.

Advanced Form of Territorial Organization of Productive Forces

by Y. Baymuratov, chairman of the Council for the Study of Productive Forces of the Kazakh SSR Academy of Sciences, corresponding member of the Kazakh SSR Academy of Sciences

/Text/ At the present stage we face big tasks in the area of raising the productive forces of the socialist society to a qualitatively new stage. The development of advanced forms of the territorial organization of productive forces, especially territorial production complexes, acquires great importance. The establishment of the TPK makes it possible to efficiently master and utilize resources, as well as natural and economic conditions in the country's various regions. As experience shows, the formation of the TPK ensures a saving of 10 to 20 percent in capital investments and operating costs and a reduction of 15 to 30 percent in the number of those engaged in production.

The Karatau-Dzhambul TPK is a large complex.

The Karatau Phosphorite Basin is located on its territory. In its raw material reserves this basin ranks on a par with the famous deposits of Morocco, Tunisia and the United States. In its importance it is considered the country's second phosphate-raw material base.

The Karatau-Dzhambul TPK was formed primarily for the purpose of an accelerated development of deposits of the Karatau Phosphorite Basin and their subsequent processing at the republic's enterprises and the country's other regions. Simultaneously with the chemical sector forming the nucleus of the TPK integrated and service production facilities called upon to participate in the social division of labor or to perform general regional functions were established and expanded.

The Karatau-Dzhambul TPK specializes in the all-Union division of labor in the chemical and sugar industry and initial wool processing and in the republic division of labor, in leather, footwear and alcohol industries and the production of spare parts for agricultural machinery and equipment for municipal needs. Today the complex meets a significant part of the country's needs for phosphate raw materials and produces yellow phosphorus, mineral fertilizers and sulfuric acid. The proportion of the TPK in the output of a number of other important products in the republic--refined sugar, ethyl alcohol, Russian leather and chrome goods, leather footwear and washed wool--is also significant.

At present the Karatau-Dzhambul TPK is developing at accelerated rates. During the previous decade the rates of growth of industrial output were 1.15 times higher there than throughout the republic.

At the same time, a number of serious lacks of coordination of a technical, socioeconomic and organizational nature have arisen in the process of development in the Karatau-Dzhambul TPK, hampering the further development of its productive forces.

In particular, a significant production potential has been developed in the chemical sector of the TPK. However, it is by no means utilized fully. In a number of production facilities no more than one-half of the capacities operate. The unplanned downtime of quarry equipment is long: owing to shortcomings in labor organization, 38 to 44 percent, owing to stoppages in motor transport operation, 28 to 44 percent and owing to the inefficient organization of the repair of mechanical and electronic equipment, more than 20 percent.

The downtime of technological equipment at chemical enterprises is long, reaching one-half of the total time available during some years.

Furthermore, the deterioration in the quality of raw materials evokes special concern in the chemical industry. In the last few years the quality of phosphorites arriving at plants has declined significantly. This, of course, has a negative effect on the level of equipment utilization and production efficiency. As specialists propose, a certain way out of the situation that has been created is seen in a selective extraction of phosphorites before the pellet factory under construction is put into operation. This will make it possible to sharply improve the state of affairs at enterprises producing yellow phosphorus and mineral fertilizers. Of course, the proposed method should be considered forced and temporary. The deterioration in the quality of raw materials compels us to pay special attention to their concentration. However, the flow sheets of concentration of the basic types of phosphorites in Karatau have not yet been worked out. It is necessary to accelerate the solution of this very urgent problem.

We face acute problems concerning the retooling of enterprises and the expansion of the assortment of products. In particular, it is necessary to equip phosphorus plants with modernized cyclone apparatus for the processing of rich phosphorus slime, that is, to develop a pilot line for the production of a new effective fertilizer--calcium polyphosphate--at the Dzhambul Superphosphate Plant.

An overall and full utilization of phosphate raw materials and a reduction in waste are some of the important problems of the TPK. At present a great deal of waste is formed and useful components are lost during the extraction and processing of ore. Many incidental elements contained in raw materials are not utilized sufficiently. For a more efficient utilization of phosphate raw materials and a rise in the level of utilization of by-products and production waste it is necessary to implement a wide range of engineering and technical measures, primarily to introduce low-waste technology. A cadastral economic evaluation of the resources of phosphate raw materials would meet the goals of their overall utilization. This will make it possible to increase the economic substantiation of the proposals advanced.

The rates of development of the national economy of the entire region also depend on the state of power engineering. The region does not have substantial reserves of fuel and power resources and power supply is based on the arrival of fuel from the outside. The insufficient provision of the region's sectors with electric power hampers the development of power intensive industries and the growth of productive forces of the complex. Stoppages in the delivery of natural gas to the TETs /Heat and Electric Power Station/ from the Uzbek SSR

right now have a perceptible negative effect on the regular operation of basic sectors. Therefore, it is necessary to draw the attention of the Kazakh SSR Ministry of Power and Electrification and contracting organizations to the acceleration of construction of the South Kazakhstan GRES /State Regional Electric Power Station/.

It is necessary to study the problem of searching for the possibility of transmitting electric power from Ekibastuz GRES directly to Dzhambul Oblast. Coal deposits discovered in Kazakhstan's southern oblasts can become a reliable fuel and power base of the Karatau-Dzhambul TPK in the future.

There is an acute water supply problem in the region. There are many water intensive production facilities here. Big volumes of water consumption are characteristic of enterprises producing mineral fertilizers and yellow phosphorus. Initial wool processing requires a substantial water consumption. At the same time, existing production facilities do not have equipment and installations, which would make it possible to repeatedly return used water to new technological cycles.

Therefore, the introduction of technology, which would ensure a closed water use cycle, is an exceptionally important task in this field. This is especially necessary, because the TPK right now has difficulties with water supply. The introduction of closed industrial water supply will also make it possible to improve the ecological situation in the region and to alleviate the strain in the water resources balance.

In order to regulate the water supply of the TPK, it is necessary to examine the problems of the possibility of transferring water resources organizations to full cost accounting, to give up their financing from the state budget and to introduce for all water consumers a charge for the use of water resources and effective economic sanctions against them for sewage pollution.

Water supplied for irrigation should be used more efficiently. It is possible to increase the irrigation capacity of water supplied to fields and to greatly expand the areas of irrigated land by raising the efficiency of irrigation systems (according to the evaluations of specialists it is possible to bring it up to 0.75-0.8).

As is well known, the problem of the need to reorganize and reconstruct the entire irrigation system was discussed at the October (1984) Plenum of the CPSU Central Committee. It seems that in the light of the plenum's decisions work on an efficient use of the region's water resources should be accelerated.

Any TPK, as a complex economic formation, should ensure a certain correspondence among the elements of its structure--specialization sectors, integrated production facilities and objects of the production and social infrastructure. Meanwhile, in the Karatau-Dzhambul TPK there are a number of disproportions negatively affecting its final efficiency. The development of production facilities performing general regional functions, primarily of the construction and repair base, the transport network and the social infrastructure, is lagging. The attained degree of overall nature of the TPK and the level of

development of the processing industry, especially the wool industry, do not reflect the region's resource capabilities and the scale and structure of economic needs.

The development of specialization sectors exceeds the growth of the potential of integrated infrastructure production facilities to a multiple degree. For example, the growth of fixed industrial and productive capital in specialization sectors exceeds the extent of their increase in machine building 70-fold and in metalworking and the construction materials industry, 20-fold.

Machine building is not developed sufficiently in the TPK. There are only two specialized enterprises here. The bulk of the machine building products are brought from the outside. Is this not one of the reasons for the unsatisfactory operation of mining equipment?

Mining and geological conditions, which are becoming complicated, require their maximum consideration in the development and production of appropriate equipment. This problem will be solved more efficiently if there is a specialized enterprise on the spot.

Individual subsectors of light and food industries determine the specialization of the TPK in the all-Union and republic division of labor. At the same time, the textile industry is represented poorly and capacities for the processing of fruits and vegetables and their per-capita production are not developed sufficiently.

The lag of the social infrastructure should be included among the significant shortcomings of the structure of this complex. This applies especially to the provision of the region's population with housing, preschool institutions and domestic and medical services. At the same time, the share of capital investments in projects for nonproduction purposes was lowered from 28 percent in 1975 to 23 percent in recent years. All this brings about a high labor turnover at a number of enterprises and has a negative effect on the economic indicators of production.

In the concept of the region's development great significance should be also attached to the protection of the natural environment and to a significant improvement in the ecological situation in the region.

Improvement in the structure of the TPK is connected with the further development of the region's mineral-raw material, fuel-power and land resources and with a fuller and more efficient utilization of labor resources.

The increase in the extraction of phosphate raw materials during the 12th Five-Year Plan and the long-term period is connected with the commissioning of new capacities at Zhanatas, Molodezhnyy, Aksay, Kok-Dzhon and Kok-Su mines. The exploitation of new phosphorite deposits dispersed over a big territory necessitates the solution of the problem of where and how to establish workers' settlements. I believe that they should be built not near every mine, but for their groups,and be located in a zone uniformly removed from the developed deposits. This principle makes it possible to reduce the amounts of capital investments connected with the construction of projects for production purposes.

The Karatau-Dzhambul TPK has reserves of quality quartzites and of building materials and a raw material base for the production of synthetic rubber and calcined soda, whose significant quantity is brought from places outside the republic.

Promising gas-containing areas have been discovered in the region in recent years. Their favorable location near the existing Tashkent-Dzhambul-Alma-Ata gas pipeline makes it possible to consider their industrial development feasible, which will contribute to an improvement in the fuel and power balance of all South Kazakhstan. Calculations performed by the Council for the Study of Productive Forces show the economic efficiency of development of gas extraction.

The insufficient development of the machine building complex can be overcome through the expansion of existing enterprises of Zapchast' /spare part/ plants and municipal machine building and the construction of a new mining and chemical machine building plant. It is necessary to study the prerequisites for the establishment of other machine building enterprises.

Marked shifts in the development of light and food industries in the oblast are not envisaged. However, the problem of the possibility of establishment in the region of industries based on raw materials developed by the factory for initial wool processing, in particular the knitwear factory, and of spinning production should be approached in a more substantiated manner.

For the purpose of strengthening the potential of the sectors of the agroindustrial complex it is necessary to study the problem of organization of the affiliates of large enterprises in small cities and rayon centers. At the same time, it is advisable to examine alternatives with the location of head enterprises in neighboring oblasts (Alma-Ata and Chimkent oblasts) and their centers.

An increase in the production of products in suburban zones and an efficient utilization of land and water resources for an increase in the production of not easily transportable and perishable products should become some of the directions in the further development of agriculture in the Karatau-Dzhambul TPK. This will contribute to a closer interaction between the TPK and the regional agroindustrial complex.

Improvement in the territorial structure of production and in the intraregional distribution of productive forces is an important problem. At present the industry of the TPK is concentrated basically in three industrial centers, that is, Dzhambul, Zhanatas and Karatau. The first is characterized by a sufficiently developed economic structure and saturation with various industries. Zhanatas and Karatau complexes are still formed mainly at the base of one sector--mining chemistry. This brings about an inefficient utilization of labor resources and leads to other economic and social costs of one-sided development.

It is necessary to more systematically pursue the policy of limiting the construction of new enterprises, especially ecologically harmful ones, in Dzhambul, accelerating the development of Zhanatas and Karatau industrial centers

and improving their structure in the context of intensifying their overall nature. At the same time, special attention should be paid to the formation of the construction industry, light and food industries and the social infrastructure. The placement of enterprise affiliates in these industrial centers, as well as in a number of regional centers (Mikhaylovka, Burnoye and so forth), is advisable. This will contribute to a more efficient utilization of labor resources, in particular to the creation of conditions for an increase in the employment of second family members.

For a fuller utilization of labor resources it is necessary, along with structural shifts, to develop measures ensuring women's employment under the conditions of an incomplete work day, an incomplete work week and work at home.

I would also like to dwell on another very urgent problem. As is well known, TPK are zones of intensive interaction of the economy and the natural environment. Production facilities connected with the development and utilization of mineral-raw material and fuel-power resources are concentrated here, which increases the ecological load. The process of urbanization, which is intensifying in connection with the formation of the TPK, is also of great importance. At the same time, TPK are able to intensify environmental protection through an increase in the overall utilization of raw materials and waste on the basis of development of integrated production facilities, improvement in the settlement system and combination of the efforts of various enterprises.

In order that the nature saving form of production in the TPK may become predominant, the development and realization of a big range of measures are necessary. We ought to coordinate fund forming indicators and the amounts of incentive funds with the level of ecological nature of production, to more widely utilize nature use standards in economic practice and to develop an economic mechanism of compensation for the damage done to agriculture by industrial enterprises.

The problem of the development and realization of a special overall regional ecological program should be studied.

The formation and development of the TPK require an overall investigation of natural and economic conditions of the developed region and the development and introduction of equipment and technology corresponding to these conditions. These problems are solved mainly on the basis of the enlistment of scientific forces from the outside. The scientific base proper, however, is developed poorly. The available scientific potential is concentrated mainly in higher educational institutions. In the region there is only one independent scientific research institution. The leading sector of the TPK--the chemical industry--is not sufficiently provided with plant science. It is necessary to pay serious attention to the organization of scientific and technical departments and laboratories at industrial enterprises and to the placement of academic and sectorial scientific institutions in the region. Proposals on first establishing here affiliates of the State Institute of Mining and Chemical Raw Materials and subdivisions of the Institute of Chemical Sciences of the Kazakh SSR Academy of Sciences deserve support. More purposeful research in the interest of the phosphorus industry would be helped by the organization of a special institute in a corresponding field as part of the republic's Academy of Sciences.

The problem of an overall utilization of phosphorites in the Karatau Basin is now solved by dozens of scientific and planning organizations. They are engaged in about 120 scientific research topics.

For the concentration of forces and funds and the acceleration of work it is advisable to unify all scientific research within the framework of the already begun goal-oriented scientific and technical program "Overall Utilization of Mineral Resources in Kazakhstan," singling out the subprogram "Overall Utilization of Phosphorites in Kazakhstan."

The appearance of the above-mentioned disproportions and shortcomings in the field of nature use and utilization of labor resources are largely due to the incomplete coordination of sectorial and territorial interests and the disconnected activity of various departments participating in the formation and development of the TPK. Comrade K. U. Chernenko, general secretary of the CPSU Central Committee, chairman of the Presidium of the USSR Supreme Soviet, drew attention to the need to eliminate these kinds of shortcomings. In his speech before voters on 2 March 1984 he stressed the urgent task of "putting an end to any actions dictated both by narrow departmental and localistic considerations."

As is well known, a number of party and government decrees and legislative acts aimed at improving the combination of sectorial and territorial development and enhancing the role of soviets of people's deputies in economic construction have been adopted in recent years. Local soviets have been granted rights to coordinate and control the activity of enterprises and organizations of superior subordination in the area of land use, nature protection, construction, utilization of labor resources, production of consumer goods and social, cultural and domestic services. Long-term and annual plans of enterprises and organizations should be coordinated with planning commissions of executive committees of local soviets. In practice, however, these extensive rights are not utilized fully.

Different alternatives of combination of sectorial and regional interests are offered now. In order to overcome the lack of departmental coordination in the construction of projects of integrated sectors and of the production and social infrastructure, we must support the proposals on the allocation by ministries of capital investments for the TPK strictly according to the specific purpose and on the centralization within the framework of the TPK of the funds of all ministries assigned for social and cultural construction. Such a procedure is checked in the course of the experiment in Poti, where a territorial-intersectorial association has been established on the basis of cost accounting principles under the city executive committee, which includes enterprises and organizations of Union, Union-republic, republic and local subordination.

In our opinion, to strengthen comprehensiveness in the development of the national economy of the TPK and to improve its planning and management, it is necessary to work out a special goal-oriented program for the development of the Karatau-Dzhambul TPK. Its long-term nature will make it possible to set goals, whose attainment requires more than one 5-year period. The program

should reflect not only problems of development of specialization sectors, but also intersectorial problems arising in connection with the economic development of the territory. It should envisage an efficient utilization of labor resources, creation of proper living conditions for people and maintenance of a favorable ecological situation. The development and realization of the goal-oriented overall program, in practice, will transform the TPK into an object of planning and will make it possible to ensure a balanced development of its sectors and links, a combination of sectorial and territorial interests, an increase in production efficiency and a unity of economic and social approaches.

The presence in the TPK of enterprises of various sectors of different subordinations complicates the problem of managing it. The sectorial approach still predominates in the management of the formation and development of the complex and territorial organs do not have powers sufficient for an active realization of regional interests. In connection with this there is the need to establish special organs for the management of the TPK. In our opinion, it is advisable to establish a special organ for the management of the Karatau-Dzhambul TPK. This could be a commission for an overall development of the TPK under the oblast executive committee, which should include representatives of party organs and managers of the region's leading enterprises. Its work will be efficient if departments of the TPK with broad powers in the solution of the most serious problems of development of complexes are established in the USSR State Planning Committee and the Kazakh SSR State Planning Committee.

The proper establishment of the boundaries of the TPK is of great importance for planning its economy and manageability. For now the adopted boundaries of the TPK are based only on existing relations. Such an approach allows their change depending on the directions in the economic development of the complex. The appearance of new production facilities, that is, for the extraction of mineral-raw material or fuel-power resources and of machine building and power enterprises, and the emergence of new economic relations will involve an expansion of the territory of the TPK.

Therefore, the prospects for the development of the Karatau-Dzhambul TPK generate the need for the establishment of its more substantiated boundaries. This important problem should be especially studied with due regard for the prerequisites for the further development of the entire region.

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GENERAL

KHACHATUROV COMMENTS ON SOCIALIST PRODUCTION EFFECTIVENESS

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[Article by Academician T. Khachaturov: "The Effectiveness of Socialist Production"]

[Text] The current stage in the development of our country's economy demands constant improvement in the economic and social effectiveness of socialist production. The directives of the 26th Congress of the CPSU on raising the efficiency of socialist production, increasing labor productivity, inducing greater social and labor activism in the Soviet population have all been reflected in the proceedings of subsequent CPSU Central Committee Plenums and in speeches by party and government leaders. Speaking at a meeting with his constituents on 2 March 1984, Comrade K.U. Chernenko said: "What is needed to move ahead successfully in implementing our social programs is the steady, dynamic growth of the economy and above all its effectiveness."[1]

Some of the top-priority tasks facing economic science, tasks aimed at developing both theory and practice, raising the efficiency and intensifying socialist production are reflected in the CPSU Central Committee decree "On enlarging the role of the USSR Academy of Sciences' World Economics Institute in developing and expounding the cardinal issues of the economic theory of developed socialism."

What does 'effectiveness of socialist production' actually mean and how can it be measured? Effectiveness is an important concept in the political economy of socialism and in the expanded socialist reproduction process. The scope of its manifestation and its impact on the reproduction process must be examined in its close interconnection with the main economic law of socialism.

The development of a socialist society has as its ultimate goal the maximum improvement of the people's welfare by way of a steady growth in production and satisfaction of their constantly expanding material and cultural requirements. All the resources society has at its disposal must be utilized to achieve this goal in the most direct way possible. It is from this that we derive the essence of effectiveness of socialist production as the maximum correlation between the effect obtained and the implemented expenditure resources at society's disposal; expenditure of public labor necessary to achieve the end result. Consequently, the task can be staged as the maximization of the effect given

the expenditures or its minimization given the effect. The expenditures and effect can be differentiated by the scale of the national economy as a whole, a specific industry of territorial unit, an association or enterprise. The correlation between effect and cost at every level is expressed in value or physical terms. We will first examine effectiveness of the national economy.

The effect society received in value terms is the value of the social product, gross or net (national income) produced in the course of a given period of time. The growth rates of the gross social product and the national income are generally close; for the last 25-year period they practically coincide (a 4.2-fold increase). However, the absolute sizes of the increments are at variance: the gross social product is more than double the size of the national income. Such a big difference stems not only from the inclusion in the gross social product of material expenditures, but also because they are counted two, three and more times at every stage of production (raw materials, semimanufacture, finished product). That the volume of the gross social product is so exaggerated is due to it being measured by the so-called factory method whereby the gross product of every enterprise is estimated as the sum total of all its outlays, including raw materials, fuel and energy, even though these were counted earlier as the output of the enterprises which produced them. Obviously, there is a need to keep track of the entire volume of production, including material expenditures, without the double count. This can be achieved by assessing the end product of every enterprise and adding amortization to the overall input of living labor. Applied to the national economy, this method allows the total value or production to be counted only once, beginning with raw materials and energy and ending with the finished product.[2] Unfortunately, statistics does now now compute the end product. That is a matter for the future. At the present time the effect of social production in value terms is measured not by gross social product, but by net output, or the national income. It was approved in decisions by top party and state organs, in national economy plans, and in economic science and practice.

All expenditures necessary for expanded production are made at the expense of the current year's national income and the fixed and working capital created earlier. First the national income is divided into accumulation and consumption. On the one hand, the greater the amount that goes into accumulation, the better the prospects for increasing production potential. However, production growth depends not only on the number of new means of labor introduced, but on their technical level and quality, as well as on improved utilization of production potential, higher labor productivity, economy of raw materials and materials and an increased equipment workload. All this is taken into account in determining the necessary share of accumulation.

On the other hand, the task is to raise the level of consumption, to determine its share and allocate the necessary funds. Expenditures on consumption, the same as reproduction of the workforce (simple and expanded), are on the rise, as are expenditures to raise the standard of living of the people and satisfy their growing social needs. All this directly affects productivity of labor and, consequently, the growth of production potential and production volume. In this lies the significance of the development of the non-production sphere for the growth of social production.

Analysis of socialist production reveals that the higher the level of the economy achieved, the greater the means that can go into consumption, into development of the non-production sphere. From time to time not only the absolute volume of consumption can go up, but its proportion of the national income as well. This, however, does not mean that the law of priority growth of the first subsector of social production is no longer valid. That law has been an immanent aspect of development throughout human history.

The national income is the source of all current and one-time (capital and otherwise)[3] expenditures necessary to develop social reporduction.

Rational distribution of the national income between accumulation and consumption exerts a significant influence on the effectiveness of social production. For its part, the latter can alter the correlation between accumulation and consumption in more complete accord with the goals of socialism. This also reflects the correlation between liesure and worktime: as production grows, worktime can be reduced and leisure time extended. K. Marx, with a socialist society in mind, wrote that "the measure of wealth will then be... not worktime, but free time."[4]

More free time is possible when the level of labor productivity is sufficiently high to satisfy more fully the personal and social needs of the people. Compared to the pre-revolutionary period the productivity of social labor in the national economy of the USSR has risen 36-fold, and more than 3-fold in the last 25 years. But there are still many reserves. Increased free time under socialism is conducive to the broadening of knowledge and experience, people's creative inclination and, consequently, their productivity. Huge possibilities are created for more rational rest.

K. Marx wrote: "Any savings in worktime is equivalent to an increase in free time, i.e., a time for all-round development of the individual which, being the greatest productive force, itself produces a reciprocal impact on the productive power of labor."[5]

The high level of people's education, culture and moral qualities as well as their high level of consumption makes for an increase in labor productivity, better organization and administration of production, greater production efficiency and quicker economic growth. all this depends in large measure on the development not only of production, but the non-production sphere as well. K. Marx noted that "a country is the richer the less the ratio, given a finite amount of available commodities, of the productive population to the non-productive."[6] Such a relationship is possible due to the higher productivity of social labor.

Reduction of worktime signifies an increase in off-the-job time. This, however, is not free time. A considerable part of non-working time is taken up by self-service chores--vital function, the cooking and partaking of food, cleaning and repairing one's home, clothes, etc. Consequently, any increase in free time depends on a reduction in the time spent on the individual's vital and consumer needs. That is why a very important factor in raising the effectiveness of socialist production is expansion and improvement of consumer services for the population, the development of trade, transportation and so on which all reduce the time the population spends on servicing itself.

It is important not only to increase free time, but to utilize it correctly for mental and physical development, cultural activities, recreation, and arts and crafts. Consequently, how effectively free time is used depends on the cultural level of the workers, the opportunities provided by society, the organizational role it plays and the amount of funds allocated for the purpose. This demonstrates the significance of the non-productive sphere which satisfies a variety of society's needs. It should be noted that in the last 25 years the proportion of workers in the non-productive sphere grew from 16 to 27 percent of the entire USSR workforce.

Regarding the question of the distribution of generated national income between current and one-time expenditures, the actual annual expenditures do not add up to the national income for the year. The fact is that participating as fixed capital in the expanded socialist reproduction of each year is the capital investment not only of the current, but of preceding years as well. The fixed production capital necessary to service the reproduction process was created in large measure with investments made earlier. Without the buildings, structures, machines and other equipment installed earlier and designed to function for a number of years the actual volume of production for every given year would be impossible. The value of all the capital expended, adjusted for the year, can be expressed as EF where E is the effectiveness and F the assets.

The general quantity of expenditures must include expenditures aimed at simple reproduction of fixed assets whose renewal is a must. These are taken from the amortization fund and must be accounted for. Moreover, a substantial part of capital investment for a given year, formed by funds accumulated in the process of reproduction, does not affect the national income for that year or the year after. This part of capital investment remains in a frozen state during the construction process. Only after completion of construction, when the fixed assets created by those investments are put into service, can both output and national income be increased. The time span from the allocation of the capital investment funds and the effect they can produce after coming onstream averages 2-3 years, but it can be less (in small-scale reconstruction and construction) or more on major facilities.

Effectiveness is characterized by two indicators--the equalling and the growth. The equalling indicators express the ratios (in comparable prices) of: national income to fixed assets; national income to capital investment (Table 1).

Table 1 (billions of rubles)

	Years				
	1980	1981	1982	1983	1984
Utilized national income	437	451	467	484	499
Fixed assets	1742	1851	1968	2092	2224
Capital investments	134	139	144	152	169
Ratio of utilized national income:					
to fixed assets (1%)	25.1	22.2	23.7	23.1	22.4
to capital investments (times)	3.86	3.24	3.24	3.18	2.95

We see from Table 1 that in the last few years the relation of utilized national income to fixed assets and capital investments is going down. However, not only the equalling indicators that are dropping, but the growth indicators as well, such as the relation of the growth in national income to capital investments or the relationship between the growth rates of national income and fixed assets. This is borne out by the dynamics of the growth indices over the past few years. (Table 2).

The ratio of annual increments in utilized national income to capital investments is improving somewhat. This is due both to acceleration of national income annual growth rates and a slowing down in the growth of capital investment. Unfortunately, though, the annual increments in utilized national income are throughout the period less than the growth rates for fixed assets. This means that production is becoming more capital-intensive and the economy is developing along capital-intensive lines.

	Years				
	1979	1980	1981	1982	1983
Annual increments of utilized national income	12	21	14	16	17
Capital investments	120	134	139	144	152
Relation to year before, %: national income increment to capital investment	10.0	15.6	10.1	11.1	11.2
Utilized national income (growth rate)	2.9	4.9	5.2	4.8	3.5
Fixed assets (growth rate)	6.5	6.5	6.3	6.3	6.3

Socialist production can and must develop at a quicker pace (than is presently the case) and, as a rule, along capital-saving, not capital-intensive lines. National income must grow at a quicker tempo than fixed assets through increased labor productivity, improved organization of production and utilization of progressive technology. Such was the case in the 50s and 60s. Thus, from 1940 to 1960 the generated national income increased 4.4 times while fixed production assets of all sectors of the national economy--3.2 times (fixed capital overall--2.9 times). In the Eighth 5-Year Plan period (1966-1970) the national income's rate of growth was higher than the growth rate for fixed assets. Consequently, development in that period was of the capital-saving type (Table 3).

	Years				
	1966	1967	1968	1969	1970
Increment in relation to year before, %:					
Utilized national income	8.1	8.6	8.3	4.3	9.0
Fixed assets	7.3	7.3	7.4	7.4	7.8

In the first half of the 70s the annual growth rate for utilized income was higher than the current figure, ranging from 12.6 percent in 1979 to 28.6 percent in the good-harvest year of 1973.

If we take the data for the last 13 years, the generated national income increased 1.8 times whereas fixed production capital--2.4 times (fixed capital overall--also 2.4 times). Over the last 3 years the national income grew 1.12 times while fixed production capital--1.22 times (all fixed capital--1.2 times).

Outstripping growth of fixed assets can be justified only if they are substantially increased in the course of scientific and technological progress, in which case the absorption of the new assets does not take place immediately.

The level and dynamics of the indicators of the effectiveness of social production are shaped by both objective and subjective factors. Relating to the objective are: changes in the correlation between the first and second subsectors of the economy with their different effectiveness--higher in the second, low in the first; more costly raw materials due to depletion of high-grade deposits and utilization of lower quality raw materials; change in haulage distances following development of outlying regions; outlays for the creation of the infrastructure in new rayons which do not yield immediate results; outlays for environmental protection, etc.

The subjective factors include: organization of production and supply which is becoming an increasingly difficult undertaking due to growth of the scale and complication of technology as well as the entire system of links between sectors and regions; the level of labor discipline; the impact of material and moral stimuli on productivity; the combining of personal, collective and public interests, and so on.

All these factors are interactive, and each taken separately does not always exert a positive influence on the effectiveness of social production, but they can and must be used in full to achieve its increase.

The party has set a task of the utmost importance--the all-out intensification of production. Intensification is inherent to the development of a socialist economy and acts as the main instrument of its further growth. Intensification signifies above all better utilization of production's inner resources, elimination of losses, better quality. This is achieved through higher labor productivity stemming from its better organization, liquidation of losses and downtime which in places approaches 25 percent of worktime. It is necessary to achieve an uninterrupted flow of materials to the worksite, ensure normal, absolutely reliable functioning of the equipment, improve repair work and the supply of spare parts. A smooth production rhythm must be attained and crash work eliminated. It is very important to have mixed professions, to apply the Shchekin method and the law on labor collectives. Much depends on strengthening discipline, developing competition, moral stimuli, and achieving a balance between personal, collective and public interests.

The biggest inner resource is better use of materials, raw materials, fuel and energy. Saving material resources and utilizing them comprehensively are necessary at every stage of production: extraction, processing, fabrication of the finished product. Much can be gained by switching to low-waste or waste-free production, lowering material input norms and utilizing secondary resources. The CPSU Central Committee has adopted a decree "On serious shortcomings in utilizing secondary material resources in the national economy: whose implementation will ensure significant savings of raw materials, materials and energy.

Raising the effectiveness of production also depends on better use of fixed production assets and equipment, upping the shift coefficient, liquidating bottlenecks, technical retooling and easier transitions from one type of product to another.

Especially important in the intensification of production is the assimilation of new technology. Above all this means new machinery based on entirely new principles and capable of producing a major effect (thermonuclear energetics, new types of artificial satellites, weather-regulating mechanisms etc.) as well as machinery known but poorly used as yet (the newest generations of computers, electromobiles, lasers, composite materials).

Effective ways must be found of mastering this and reducing its amortization period; in a number of instances refusing repairs of worn-out equipment. The task of the day is to replace manual labor with automation, mechanization and robotization of production. This prompts a question: won't all these call for more capital investment, the creation of additional capacities in machine-building and increased consumption of raw materials?

Over the last few years the relation between consumption and accumulation stood as follows (in percentages):

	1970	1975	1980	1981	1982	1983
Consumption	70.5	73.4	76.1	76.4	73.8	73.2
Accumulation	29.5	26.6	23.9	23.6	26.2	26.8

The above were done on factual prices. Bearing in mind the different price levels (compared to cost) on the output of sub-sectors I and II of social production, the relative weight of accumulation is even higher. Under any circumstances, to go for an increase in capital investment by raising the accumulation quotient is hardly possible, especially if we consider the need to increase the output of consumer goods, eliminate shortages, balance the correlation between supply and demand and implement other measures designed to encourage higher labor productivity.* If in the numerator of the relationship we enter the given year's national income as the effect, and in the denominator--the national income as outlays (minus the prepaid and frozen parts of capital investment) plus amortization and fixed assets adjusted for the year, what we get is a formula for the effectiveness of social production (ϑ):

$$\vartheta = \frac{v + m}{v' + m' + a + EF'}$$

where $v + m$ = the national income for the year
v' = the necessary product utilized in the given year
m' = the surplus product utilized in the given year
a = amortization
E = coefficient of effectiveness (normative)
F = fixed assets

*Based on the above it is possible to conclude that calculation according to cost allows us to express the effectiveness of social production in a single indicator, representing the relationship of effect to expenditures.

Designating v + m as D and v' + m'$_1$ + a $\frac{D}{P + EF}$ leading to the end product as P, we arrive at the equation

$$\text{э} = \frac{D}{P + E + F}.$$

Let us designate the m' - m'$_1$ part of the national income as $m\frac{1}{2}$. It represents that part of accumulation which is prepaid and frozen in the process of capital construction and will influence the growth of production only in the future. In the indicator of effectiveness in value terms it is not possible to separate specific types of effect (and outlays), both direct and indirect, from measures of a social character, in other words, the effect and costs of education, health, social security, various kinds of services (hence the need to use indicators expressed in physical terms).

The same shortcomings characterize other attempts to compute the effectiveness indicator in cost terms. Thus, there was a proposal to introduce the indicator $\frac{v + m}{c + v + m}$ which expresses the relation of the national income to the gross social product--with all its inherent flaws.* The denominator of that formula contained the quantity m, less the share of the surplus product that is not allocated for accumulation but is spent on non-production needs. As we have seen, however, these outlays are just as necessary to produce an effect in the national economy.

In the opinion of A.I. Notkin, the national income should be correlated to the expenditures of living labor $\frac{NP}{L}$ and embodied labor $\frac{NP}{F}$ (NP = national income, L = living labor, F = fixed production assets). To arrive at a single indicator the use was recommended of the coefficient a which allows the expenditures of living and embodied labor to be equated. The resulting formula was $\frac{NP}{L} + a\frac{NP}{F}$ which is basically similar to the so-called Cobb and Douglas production function $P = AL^aK^{1-a}$ where P = output, L = workforce, K = fixed assets, A and a = the function's parameters.

Not much different from this is the formula proposed by S.M. Vishnev:

$$Q_{ep} = AK^aL^bE^cR^d$$

where Q_{ep} = national end product, K = assets, L = workforce, E = expenditures for education and refresher courses, R = expenditures for scientific research and experimental project and design work, a, b, c and d = coefficients of elasticity for K, L, E and R respectively.

The above formulas do not exhaust all the factors that influence the effectiveness of production.

In addition to the indicator for the effectiveness of social production in value terms, the same is also computed in physical, material terms.

The output of industry , agriculture, transport and construction are expressed in physical terms. This provides us with information about the amount of fuel extracted, steel smelted, cement produced, as well as machines, fabrics, grain, meat and so on. It is impossible to simply add up commodities. However, the

*Such a relationship should diminish according to the exchange of live labor with the means of labor.

level of development of production in the national economy can be assessed by considering a limited number of the most important indicators--fuel, metal and others. Physical indicators can also express non-production results which have important significance in standard of living (commissioned housing, schools, institutes, hospitals, sanatoriums, utilities etc). Finally, indicators reflecting the development of science, culture, education, publishing, theatres, cinemas and museums can be expressed in physical terms too.

Physical indicators reveal the structure and the output of the production and non-production spheres, allowing an approach to the problem of needs and the question of how best to satisfy them taking into account their urgency. Such juxtapositions are constatnly undertaken in the process of planning the national economy. The needs of production, science, technology, administration, defense, the personal needs of the citizens are identified and measured against available resources; decisions are then taken concerning distribution. This author has proposed the following classification of needs.

Classification of Needs

Personal (of each member of society)

Material Wealth
- Food
- Clothing
- Housing
- Culture and household objects

Material services (processes)
- Utilities
- Transport
- Repairs of footwear, clothing
- Distribution of other properties

Non-material services
- Education
- Acquisition of experience and skills
- Raising the cultural level
- Health Improvement
- Physical culture and sports, tourism
- Rest and recreation

Need to participate in public activities
- Participation in party, Soviet and labor union organizations

Social (of society as a whole)

Production needs
- Natural resources--land, forests, mineral deposits, water
- Means of labor
- Objects of labor
- Transport
- Production infrastructure
- Supply and sales
- Cadres

Non-production needs
- Education and its organs
- Public health services
- Physical culture and sports
- Science institutions and development of science
- Cultural institutions--theatres, cinema, museums
- Retail trade
- Housing and utilities

Public administration and security needs
- The party, labor unions
- Administration of the state
- Regulation of the economy
- Banks, finance
- Army (external security)
- Internal security, the militia, the courts, etc.

The above needs have different levels of priority, but those needs have not been quantitatively determined. Nevertheless, the actual planning and administration processes invariably proceed from different degrees of priority for dissimilar needs, for example, in determining the volume of investments to go into housing construction, production of clothing, footwear, cultural articles, household goods and so on.

We can to some extent assess the actual degree of satisfying needs. Evidently, both the priority and the satisfaction quotients of this or that need can be computed accurately enough on the basis of statistics and questionnaires. We have developed scientific norms for satisfying the demand for food--overall, by calorie count, by individual items--for clothing, housing, etc. This also helps to determine the degree to which various needs are satisfied in the context of our common aspiration toward developing socialist social production and raising the material and cultural level of the people.

It is also necessary to determine to what extent this or that need can be satisfied by way of a corresponding development in production. To do that one has to know the volume of the concomitant expenditures (one-time and current) and the approximate time frame of the necessary surge in the production of the given commodity. This is one of the most important preconditions for achieving a balance in the national economy.

Having established what is required for the development of production, the next step is to set the target figures for the given period, taking into account the level already achieved. The correlation between the two sectors of socialist production is determined on the basis of the law of priority development of the first sub-sector which ensures technological progress and the replacement of living labor by machines.

Individual industries have their own specific features which exert a greater or lesser influence on their development and effectiveness. Among the industries, a leading position is occupied by energetics, extraction of fuel and production of energy, and these must evolve at a rapid rate to ensure technological progress and higher labor productivity. Several problems arise here that have to do with the availability of several sources of fuel and energy, the required capital investment and current outlays, concerns relating to the protection of the environment. A special place among the industries is occupied by the machine-building complex. Its development is aimed at accelerating technological progress in the national economy and raising the productivity of socialist labor. In addition to the quantitative, qualitative factors are becoming increasingly important. For example, there is an urgent need to improve the quality of various steels, introduce modern, progressive methods of production in metallurgy, machine building and metalworking which would allow them to satisfy demand with a smaller increment in production. Better quality cement and other construction materials will result in less costly and quicker construction. Forest exploitation must be organized on a more rational basis with complete utilization of forest resources and widespread application of comprehensive processing of timber.

In order to directly meet the people's personal needs there must be a substantial improvement in the light and food industries, especially in the production

of cultural and household articles, TV sets, VCRs, radios, various home appliances as well as bicycles, cars and so on, let alone clothing, footwear and food. All this, together with expanded housing construction must be so structured as to satisfy effective consumer demand and thereby promote strengthening of economic incentives for raising productivity and, consequently, heightening the effectiveness of social production.

The development of sub-sector II economy depends in large measure on how it is supplied with the output of sub-sector I--the means of production. The production of a developed industry is essential (instruments, equipment and other electronic devices, computer hardware--microprocessors, automatic machines, various engines and motors as well as all types of high-quality materials, metallic and synthetic) and various products of agriculture, including animal husbandry, for the production of agricultural raw materials and food.

All this demands major capital investments and current expenditures which must be measured against the direct and indirect effect the measure will have for the given industry and the national economy as a whole. And it is not so much the volume of these outlays that matters as their correct utilization. For example, it is essential to analyze why investments in agriculture do not always yield the desired results, on what the increase of this yield depends, to what extent these results depend on objective reasons, weather conditions, for example, and to what extent on subjective and therefore surmountable factors--unsatisfactory farming methods, bad maintenance of machines, inadequate land care, low labor productivity.

It is very important to observe a comprehensive approach to the solution of economic problems. In particular, the tendency to underestimate the development of the infrastructure--warehouses, roads, primary processing--especially in agriculture, must be done away with once and for all. Outlays for infrastructure development, capital and current, often produce a bigger effect in the matter of delivering the goods to the consumer than outlays on the development of production because they help avoid losses, preserve the finished product. This explains the fact that capital investments into the construction of storage facilities, even such costly ones as [grain] silos are amortized in a short period--2 to 3 years. Infrastructure development is a process that calls for careful analysis to determine its absolute and relative effectiveness.

It is important to determine the effectiveness of the national economy's entire transport system, including railroads, maritime, river, automobile, air, pipeline transport and power lines. Outlays on the development of all types of transport allow a more rational territorial distribution of production, acceleration of commodity turnover in the national economy, elimination of production downtime and of losses from spoilage. Taking all these factors into account will make it possible to determine the actual effectiveness of transport development and to substantiate the expenditures that will be required.

Outlays, like the effect, must be expressed not only in value, but in physical terms as well. Knowing how many workers, materials energy and equipment are needed to implement the outlined program, we can set the target figures for all

the industries concerned, utilizing the estimated natural indicators of both the planned and actual effect. Such an approach will allow to draw up substantiated material balances for production, distribution and consumption of the goods, which were discussed above.

All these are complex tasks in the matter of raising the effectiveness of socialist production. Their solution calls for significant restructuring of production organization and its management. We must relinquish our incorect perception of democratic centralism as being the petty oversight of the enterprises, [one that] limits their initiative, their independence. Expanding their rights in the sphere of economic management at the same time means enhancing their responsibility for the assigned tasks. We must demand strict compliance with delivery agreements, while at the same time strengthening the the effectiveness of current economic and moral incentives and ensuring the complete satisfaction of effective demand.

Measures directed at the fundamental improvement of management and planning of the national economy must be taken, which is what the party and the government have undertaken and who are bringing about the large-scale economic experiment. The greater initiative and responsibility of the enterprises have already produced favorable results.

Having ensured proportionality and balance, the advantages of the socialist economic system, public ownership of the means of production, a planned economy, and the utilization of all types of interests create the potential to speed up the growth rate of the economy and to raise the economic and social effectiveness of production, and consequently, the welfare of the people in accordance with the main goal of socialism.

FOOTNOTES

1. K.U. Chernenko, "Narod i partiya yediny" [The People and the Party are One], Moscow, Politizdat, 1984, p 9.

2. "Ekonomicheskiy stroy sotsializma" [The Economic System of Socialism], Vol 1, Moscow, Izdatel'stvo "Ekonomika", 1984, p 335.

3. Including replenishment of working capital and stockpiling of contingency reserves.

4. K. Marx and F. Engels, "Polnoye sobraniye sochineniy" [Complete Works], Vol 46, part II, p 27.

5. Ibid, p 221.

6. Ibid, Vol 26, part I, p 215.

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